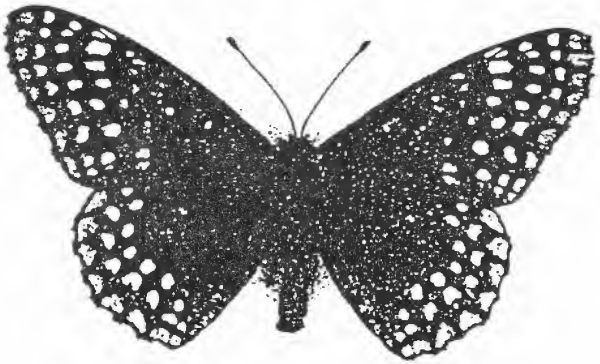
THE MARYLAND ENTOMOLOGIST



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EUPHYDRYAS PHAETON

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The purpose of the Maryland Entomological Society, which was formed in November, 1971, is to promote the science of entomology in all its branches, to provide a meeting place for professional and amateur entomologists residing in Maryland and the District of Columbia, to issue a periodical and other publications dealing with entomology and to facilitate the exchange of ideas and information through its meetings and publications.

Membership in the Society is open to all persons interested in the study of entomology. All members receive the journal, Maryland Entomologist, and the monthly newsletter, Phaeton. Institutions may subscribe to the Maryland Entomologist but may not become members. Prospective members should send to the Treasurer full dues for the current year, together with their full name, address, telephone number, and special entomological interests.

Active members - annual dues $5.00
Junior members - annual dues $3.00
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Send remittances, payable to Maryland Entomological Society, and address changes to: Edgar A. Cohen, Jr., 5454 Marsh Hawk Way, Columbia, Maryland 21045.

Back issues of the Maryland Entomologist and recent issues of Phaeton are available, to members, from the Treasurer. Phaeton is .25¢ per number and the Maryland Entomologist is $1.25 per copy.

The Maryland Entomological Society is a non-profit, scientific organization. Meetings are held on the third Friday of October, November, February, March, April and May, at 8:00 p.m., in Room 403 of the Biological Sciences Building, University of Maryland Baltimore County.

The Maryland Entomologist is published irregularly by the Maryland Entomological Society. There are four numbers in each volume. Original articles on geographic and temporal distribution, particularly pertaining to Maryland and adjacent states, ecology, biology, morphology, genetics, systematics, behavior, etc. are welcome. Book notices and reviews, requests for information, notes on distribution, occurrence, migration, life history and others will be published. All articles are subject to editorial review and acceptance. They should be sent to Robert S. Bryant, 522 Old Orchard Road, Baltimore, Maryland 21229.

This publication should reflect the interests, views, and talents of the entire membership. It will be viable as long as everyone deems his contributions as necessary and meaningful for its continuance

The logo of the Maryland Entomological Society features the Maryland Shield and a specimen of Euphydryas phaeton (Drury), the Baltimore checkerspot, which became the official insect for the state of Maryland through the efforts of many of the members of this Society.

THE MEMBRACIDAE (HOMOPTERA) OF MARYLAND - PART I

Mark J. Rothschild

This is the first of several papers that will survey the membracid fauna of Maryland. The subfamilies Stegaspinae, Membracinae, and the Smiliinae tribes Acutalini, Amastrini, Micrutalini, and Polyglyptini are presented here. Future installments will survey the large Smiliinae tribes Ceresini and Smiliini in Maryland. Although there have been quite a number of regional studies of this group in North America (Kopp & Yonke 1973a), there has been no published study specific to the entire state of Maryland. McAtee (1921) did include collection records from Prince George's and Montgomery County suburbs in his survey of the membracids in the Washington, D.C. area. Those specimens at the U.S. National Museum (Smithsonian Institution) have been made available and the records are included in this paper. The bulk of the data is from three years of concentrated collecting within the State. As most of my time and effort has been centered on the nine counties of the Eastern Shore of Maryland, that area has been disproportionately surveyed. To try to fill in some of the gaps, the following institutional collections have been examined and Maryland records included: USNM (Smithsonian Institution), Towson State University, Salisbury State University, University of Maryland (College Park), Port of Baltimore (APHIS-USDA), and Maryland Department of Agriculture (Annapolis). Even with all this data, Western Maryland, Southern Maryland, Howard, Harford, and Carroll counties have been only weakly sampled and represented here. Future collecting efforts will try to concentrate on these geographical areas.

The Membracidae make up a family of Homoptera that is more or less familiar to most general collectors. Membracids can be distinguished (in general terms) from members of other families in the Suborder Auchenorrhyncha in that they have the pronotum modified or expanded in some way, often extended back over the abdomen dorsally and/or projecting forward and over the head.

The use of the common name "treehoppers" to describe this family is somewhat of a misnomer since only certain species inhabit trees (or shrubs) and some of these for only part of their life cycle. In general, there are three distinct life cycle patterns that the Maryland species exhibit.

The first can be referred to as the arboreal life cycle. In this type of development, the eggs are deposited and overwinter in slits beneath the bark of twigs of deciduous trees. The nymphs hatch in the spring, and all activities including feeding, molting, mating and the ensuing ovipositing are accomplished on the same woody host over the next few months. There is usually one generation per year with a few exceptions in Maryland. Microcentrus caryae (Fitch), M. perditus (Amyot & Serville), Enchenopa binotata (Say) and Vanduzea arquata (Say) display this life history pattern.

The second developmental pattern can be termed the semi-arboreal life cycle. Again, the eggs are deposited and overwinter within bark slits of a host tree, but upon hatching, the nymphs drop to the ground and find suitable herbaceous plants on which to feed and complete their development. In late summer or early fall the adults again move onto the woody host to lay their eggs for the next generation. As far as is known, all of the species in Maryland with this life cycle are univoltine. Micrutalis calva (Say) is an example of an insect that shows this developmental behavior. Most of the tribe Ceresini (not covered in this paper) also exhibit semi-arboreal life histories.

The third developmental pattern can best be described as the herbaceous life cycle. Usually, adults of this type overwinter in leaf litter or grass clumps. Oviposition occurs in the spring into stems or leaf midribs of host herbaceous plants. There are usually at least two generations in maryland with considerable overlapping of generations in any given year. They are often among the most commonly collected species locally, and the host plant species range is typically quite large and diverse. Examples of herbaceous membracids include Campylenchia latipes (Say) and Entylia bactriana Germar.

The taxonomy of this group has been fairly well worked although there are still areas of confusion. The higher taxa for the New World membracids has been categorized quite well by Deitz (1975) and most taxonomic uncertainty occurs at the specific or generic level. The taxonomic keys presented here will work for Maryland treehoppers, but

are not meant to be comprehensive tools for identification outside the mid-Atlantic region.

Key to the Maryland Subfamilies and Tribes of Membracidae

(modified from Kopp & Yonke 1973a)

1. Scutellum present and exposed.....Stegaspinae
   Scutellum absent or entirely concealed by the pronotum.....2
2. Protibiae foliaceous.....Membracinae: Membracini
   Protibiae simple.....3
3. Metatarsi much shorter than pro- and mesotarsi.....
   .....Membracinae: Hoplophorionini
   Metatarsi as long as or longer than pro- and mesotarsi.....
   .....(Smiliinae) 4
4. In lateral view, wings entirely uncovered by pronotum.....5
   In lateral view, wings partially hidden by pronotum.....7
5. Corium of wing with 2 longitudinal veins contiguous at their bases
   .....Ceresini
   Corium with 3 longitudinal veins originating near the base of the wing.....6
6. Veins of wings darkly pigmented, length greater than 4mm.Acutalini
   Veins lightly pigmented, length less than 4mm.....Micrutalini
7. Pronotum in lateral view strongly or weakly medially notched or depressed.....Polyglyptini
   Pronotum in lateral view modified in various ways but not with a medial depression.....8
8. Corium with 2 longitudinal veins contiguous at their bases; usually associated with black locust.....Amastrini
   Corium with 3 longitudinal veins usually contiguous at their bases.....Smiliini

SUBFAMILY STEGASPINAE Haupt

Tribe MICROCENTRINI Deitz

Genus Microcentrus Stal

Key to the Maryland species of Microcentrus

1. Suprahumeral angles and often horns present on pronotum.....
   .....M. perditus
   Suprahumeral angles not present.....M. caryae

Microcentrus caryae (Fitch) 1851

This is a relatively uncommon insect in Maryland. Its range extends north into Canada, south into Florida, Texas, and northern Mexico, and west into Kansas, Nebraska and Oklahoma. It is apparently not abundant anywhere in its range. Host records concentrate on Carya spp. but Juglans and a few Quercus spp. have been noted in the literature. As previously mentioned, it displays the arboreal life cycle and is univoltine in Maryland.

Maryland seasonal distribution: 30 July - 27 September (most records in September).

Maryland county records:

	July	August	September
Allegany:			23
Frederick:			2,12
Kent:			18
Montgomery:		20,26,30	5,12,13,14,27
Prince Georges:	30	23	27

Maryland host plants: Carya spp. are the only determined hosts here.

Microcentrus perditus (Amyot & Serville) 1843

This is also a species that is not often collected in Maryland or elsewhere in its range which extends north into New York, Canada, and South Dakota, south to Florida, and west into Arizona, New Mexico, Texas, and Colorado. Within this general area, M. perditus has not been collected in a number of states, but it probably occurs in most if not all of them. The literature lists Quercus ilicifolia Wang. (scrub oak) and Q. macrocarpa Michx. (bur oak) as hosts, but I have never found it on Quercus spp. I have collected it only on Carya sp. both in

Maryland and in Georgia. The life history appears to be similar to M. caryae.

Maryland seasonal distribution: 14 June - 17 October (most records in Fall).

Maryland county records:

	June	July	Aug.	Sept.	Oct.
Baltimore:					4
Dorchester:		10			
Frederick:				12	
Montgomery:		1	26,30	13,28	5
Prince Georges:	14,15				6,11,17

Maryland host plants: As previously mentioned it has been collected on Carya sp. (hickory). In Frederick County it was collected at the same time and place as M. caryae. This seems to be contrary to most published information on these species. Obviously more work on the ecology of this genus is indicated.

SUBFAMILY MEMBRACINAE Rafinesque

Tribe MEMBRACINI Rafinesque

Key to the Maryland genera of Membracini

1. Pronotum not projecting forward into a horn; in lateral aspect sinuate dorsally.....Tylopelta
   Pronotum not as above; pronounced pronotal horn distally.....2
2. Pronotum behind horn with two yellowish spots on dorsal surface; usually associated with trees or shrubs.....Enchenopa
   Pronotum without yellowish markings; usually associated with herbaceous plants.....Campylenchia

Genus Campylenchia Stal

Campylenchia latipes (Say) 1824

This is one of the most commonly collected membracids in Maryland and throughout North America. It exhibits considerable variability in the size and shape of the pronotal horn but this does not seem to be significant taxonomically. It displays the herbaceous life cycle with a few modifications. Unlike most species with this developmental pattern, it usually overwinters as an egg embedded in the base of the host plant stem. There are records of adults in the Spring which suggest that some individuals may overwinter in the adult stage, but I have been unable to verify that in Maryland. Kopp & Yonke (1973a) reported several generations in Missouri, and Maryland populations appear to be bivoltine.

Maryland seasonal distribution: 10 June - 12 November.

Maryland county records:

	June	July	Aug.	Sept.	Oct.	Nov.
Anne Arundel:		10,12,25		3,4,19,21		
Baltimore:	18,22	1,4,9-12, 20-23,26, 27,30	3,4,16, 30	8,10,16,19 21,24,29	4,5,6, 10,11, 25	
Calvert:				24,27		
Caroline:					15	
Cecil:	29	7		13		
Dorchester:		20		9		
Frederick:	26,28	30		12,23		
Garrett:				12		
Howard:	10					
Kent:				7,18	24	
Montgomery:	17	1,4,6,13, 14,31	3,23	1,7,12,28		
Prince Georges:	15-17	8,15,17,23 24,28,31		7,8,13,25	4	2
Queen Annes:				26		
Somerset:			6			
Wicomico:			2	7	16	
Worcester:				27	11,17	12

Maryland host plants: Solidago spp.,Medicago sativa, Aster spp., Ambrosia spp., daisies, and various undetermined herbaceous plants.

Genus Enchenopa Amyot & Serville

Enchenopa binotata (Say) 1824

This treehopper can be locally very abundant, but is not as widespread in Maryland as some of the other common species. It is found in virtually every state east of and including Texas, Oklahoma and the Dakotas, as well as Utah and Arizona. It displays the arboreal life cycle and is univoltine in Maryland. Host plants include Robinia pseudo-acacia L., Celastrus scandens L., Ptelea trifoliata L., Viburnum spp., Cercis canadensis L., Juglans cinerea L., Juglans nigra L., and Carya spp., On certain hosts, the egg slits are covered with a frothy white protective "wax" that the female deposits immediately after oviposition.

Maryland seasonal distribution: 24 May - 22 October.

Maryland county records:

	May	June	July	Aug.	Sept.	Oct.
Allegany:					23	
Anne Arundel:	24	12				14
Calvert:		20				
Cecil:			3,29		16	
Frederick:					23	
Kent:			3		18	22
Montgomery:		7,10,17,21 28-30	5,17,30	7,9,11,24 27,28,30	12,14	
Prince Georges:		16,22	1	3,13,19	2	
Queen Annes:		8				
Talbot:		14				
Washington:		30	6			

Maryland host plants: Cercis canadensis, Robinia pseudo-acacia, Carya spp., Juglans spp., and Viburnum spp.

Genus Tylopelta Fowler

Tylopelta americana (Goding) 1893

This is a southern species that barely reaches Maryland. It is reported south to Florida and west to Missouri, Arkansas, and Texas. It has also been found in Arizona. The life history has not been worked out completely, but it evidently overwinters in the egg stage in association with its only known hosts - Desmodium spp.

Maryland seasonal distribution: Unknown.

Maryland county records:

Wicomico: 1 specimen collected, according to the label, at Salisbury on 5 September 1977. It has been deposited at the Maryland Department of Agriculture collection in Annapolis.

Maryland host plants: Unknown, but Desmodium spp. occur throughout the state.

Tribe HOPLOPHORIONINI Goding

Genus Platycotis Stal

Platycotis vittata (Fabricius) 1803

This is a large, common, and widespread insect in Maryland. It can be found throughout the eastern U.S. as far north as New York and into Canada, west to Illinois, Missouri, Oklahoma, and along the southern U.S. border from Florida to Texas. It is also found along the West Coast, Arizona, Utah, and into Mexico. The life history was worked out by Wood (1976) in Ohio and our local populations agree closely with his observations. There are two generations per year; the overwintering adult female deposits her eggs into the tips of deciduous host tree branches and remains on the site throughout the subsequent egg hatch and nymphal development of her offspring. The female will tend her brood on the branch long after they have molted into adults if not disturbed. The young adults exhibit a color pattern (four thin red lines running the length of the pronotum) that they will eventually lose as they age (sclerotize). In the past this dimorphism has resulted in taxonomic confusion, but it is quite clear that only one species is present. There are both horned and hornless individuals present in an aggregation of sibling nymphs or adults. In Maryland, the Spring brood consists mainly of horned females and hornless males, but the

Fall brood contains predominately hornless individuals with occasionally a few horned female exceptions. Also in some aggregates of the Fall brood, the males are significantly smaller than the females. Host plants cited in the literature include many Quercus spp., Betula nigra L., and Castanea sp.

Maryland seasonal distribution: 2 February - 9 December.

Maryland county records;

	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
Allegany:						24		
Anne Arundel:	(2 Feb.) (9 Dec.)	9		9				29
Baltimore:		25	6,11				11	8
Calvert:		28	15					30
Caroline:	24	10	24		29		8,24, 31	
Cecil:				3			7	
Charles:	27			10		23		30
Dorchester:		21					7-14	
Frederick:						12,24,29		
Howard:		28				22,23,26		
Kent:	(2 Mar.)						1,22, 28	20
Montgomery:				2,17	2,21, 23	3,12	28	
Prince Georges:		21	6	12	3,13	2,13,26 27	25,27	29
Queen Annes:					23	19		
Somerset:	24	15,28						
St. Marys:								16
Talbot:	16						9,15	
Wicomico:		3,11-15 18,20, 22,25, 26,28	1,4,8, 29			5	2,7, 17,21 24,29, 30	1,11, 13-15
Worcester:		7,17-19 21	5			17,25		

Maryland host plants (plants with aggregates of nymphs and/or adults or adults tending eggs in the bark): Quercus bicolor Willd., Q. palustris Muench., Q. phellos L., Q. falcata Michx., Q. acutissima, Q. alba L., Q. nigra L. Q. coccinea Muench., Q. stellata Wang. Betula nigra L., Castanea sp., Platanus acerifolia Willd.*, and Fagus grandifolia Ehrh.*.

* represents previously unreported host.

SUBFAMILY SMILIINAE Stal

Tribe ACUTALINI Fowler

Genus Acutalis Fairmaire

Acutalis tartarea (Say) 1830

This is another membracid in which the taxonomy has been confused because of color and pattern dimorphism. At present, all of the variations have been placed in synonymy (Kopp & Yonke 1973a) although Caldwell (1949) recognized three distinct varieties and Metcalf & Wade's General Catalogue (1965) assigned them species rank. I believe that the southern form, A. inornata, is significantly distinct to merit species consideration and I intend to work on that in the near future. This form has not been found in Maryland and the only specimens that I have collected are from Florida. Acutalis tartarea is common and widespread in Maryland. It ranges from Massachusetts and New York south to Florida, west to Texas, Utah, Colorado and South Dakota. It exhibits the typical herbaceous life cycle except that eggs probably overwinter at the base of host plants since adults are not collected until late June. There are probably at least two generations per year with considerable overlap. Recorded host plants include Robinia pseudo-acacia, Ambrosia spp., Solidago spp., Helianthus sp., and various other members of the Compositae.

Maryland seasonal distribution: 14 June - 29 October.

Maryland county records:

	June	July	Aug.	Sept.	Oct.
Anne Arundel:		30		9,21,27	1,4
Baltimore:		12	5,18	5,15,18, 25,28	1,9,10,23
Calvert:	20,24	3			
Cecil:		24			
Dorchester:	20			9	
Harford:					7
Kent:	20		19	5,18	
Montgomery:	15,17, 23,29	4,6,8, 11,13,16, 23,27,30	15,18, 21,30	5,12-14, 16	5,29
Prince Georges:	14-16, 23,24	1,8,11, 13,27,28	2,10	3-5,8,26, 30	6,14
Queen Annes:				19	
Somerset:	24			13,15	22
Wicomico:				18	
Worcester:				9	18

Maryland host plants: Ambrosia sp., Solidago sp., Aster sp., Verbesina occidentalis, and unidentified herbaceous plants.

Tribe MICRUTALINI Haupt

Genus Micrutalis Fowler

Micrutalis calva (Say) 1830

This is the smallest membracid found in Maryland. It is fairly common although infrequently collected due to its size and strong leaping ability. It is found throughout the eastern U.S. extending west into Texas, New Mexico, and Colorado. It is also present in Canada and Mexico. Micrutalis calva displays the semi-arboreal life cycle with eggs deposited in woody plants and nymphs developing on herbaceous plants. Adults can be found on both types of hosts during summer and fall. Host plant records include Robinia pseudo-acacia, Gleditsia triacanthos L., Helianthus sp., Ambrosia sp., and Veronia sp. There is one generation per year for this species.

Maryland seasonal distribution: 6 June - 31 October.

Maryland county records:

	June	July	Aug.	Sept.	Oct.
Anne Arundel:		1	10		
Calvert:	20,27		18		
Caroline:	17				
Cecil:	29				
Charles:			9		
Howard:	26				
Kent:	16	17	3		
Montgomery:	12,15,17,22	1,3,4,7,14	15,18,22, 30		
Prince Georges:	15,20,23,25	3,8		11,26	
Queen Annes:			1		
St. Marys:	6	12			
Talbot:					31
Washington:				1	
Wicomico:				19	

Maryland host plants: Robinia pseudo-acacia, Amaranthus sp., and unidentified herbaceous plants.

Tribe AMASTRINI Goding

Genus Vanduzea Goding

Vanduzea arquata (Say) 1830

This is a very common small species found exclusively on Robinia pseudo-acacia in Maryland. Both adults and nymphs are tended by ants and there are several generations per year. Eggs overwinter with the first adults recorded in Maryland in late May. Nationally, it extends north into New York, south to Georgia and west into Texas, Oklahoma, Kansas, Colorado, and Arizona. Curiously it is not recorded for Alabama, Mississippi, Louisiana or Arkansas within this range. Funkhouser (1915) worked out the life history in New York and found four generations per year with considerable overlap of instars and generations. Eggs overwinter embedded in the bark of their host plant near the base

of a bud scale.

Maryland seasonal distribution (adults): 20 May - 16 November.

Maryland county records:

	May	June	July	Aug.	Sept.	Oct.	Nov.
Anne Arundel:	24	11	2,4,29	14		18	
Baltimore:				25	18	23	
Calvert:		24,27		18	26		
Caroline:					26		
Cecil:		19	7,10-12, 24,25,29	4,7, 29	13,16,20, 27,30	25,31	
Charles:	21,31				23		
Dorchester:		19			21,24	9	
Frederick:					12,24		
Garrett:				11	11		
Howard:	20						
Kent:	29	5,6, 13,14	3,9,13, 19,25	7,8, 19	3,18,20	11,14, 18,22, 24-28	1, 4,7
Montgomery:		7,8,11-13, 17,18,24,27	8,20,30	7,10	2,7,27, 28	5	
Prince Georges:		3,4,6,7,9, 12,20,23-25	1,3,31	2,3, 10,17	2,8,18, 24		
Queen Annes:				23		16	
Somerset:		11	30	6			
St. Marys:	21						16
Talbot:		14	17	17	14	31	
Washington:			3		1		
Wicomico:	27	7,8		26	3	15,24	6
Worcester:					27		

Maryland host plants: This insect is only known to complete its life cycle on Robinia pseudo-acaçia.

Tribe POLYGLYPTINI Goding

Key to the Maryland genera of POLYGLYPTINI

1. Medial dorsal notch very pronounced.....Entylia
   Medial dorsal notch merely a slight depression.....Publilia

Genus Entylia Germar

Entylia bactriana Germar 1835

This is arguably the most common membracid in Maryland. The taxonomy as it relates to species is still very much up in the air with the following names here considered as synonyms: Entylia concisa Walker, E. carinata Forster, and E. sinuata (Fabricius). The species epithet "bactriana" is used here to try and correlate with more recent studies (Kopp & Yonke, 1973b; Wood, 1977) and in no way is meant to represent the final accepted species name(s). It is my belief that until better differentiating characters are found (and accepted) the Maryland specimens represent a single species since often in an aggregate population several of the morphotypes can be readily distinguished. Entylia can be found throughout the continental U.S., Canada, and into northern Mexico. Adults overwinter in grass or litter beneath herbaceous host plants. There are several generations per year in Maryland, the exact number being unclear at present. Wood (1977) found two generations in Ohio but there seems to be so much overlap of generations here in Maryland that more precise observations are needed to be sure of the number. Adults can be found throughout the state in every month from May through October. Adult females deposit an aggregate of eggs into the midrib of a host plant and remain in close proximity at least until the eggs hatch. The resultant nymphs remain in an aggregate usually with the adult, and are typically tended by one of several species of ants. The sibling adults will often remain in a loose aggregate but the ants are usually absent by this time. Recorded hosts include a large number of very common herbaceous plants such as Ambrosia sp., Solidago sp., Circium arvense (L.), C. vulgare (Savi.), Helianthus sp., and Eupatorium sp.

Maryland seasonal distribution: 26 April - 4 November.

Maryland county records:

	Apr.	May	June	July	Aug.	Sept.	Oct.
Anne Arundel:		12,21, 23,31	1,6, 25	22	3	4,9,11, 19,26	15
Baltimore:		12,16,19, 25,26		17	15,25	17,18, 20,28	4,15
Calvert:		18			9,31	3	
Caroline:		9	24	17	5	26	15
Carroll:			1				
Cecil:				7,12,14, 24,25		16,27	16
Charles:		1				23	
Dorchester:		21		20		9,21,24	
Frederick:						24	
Harford:		21					
Howard:		22					
Kent:		16,20, 21,23	10,20	3,9,17, 25,30	3,8, 14,19, 27,29	18	10,12,14, 18,20-24
Montgomery:	26,28	4,6,9,10, 13,17,19, 23,24	2,8, 13,15, 17,23	4,6,13, 16,20, 22,23,27	3,4, 25,26	2,5,12, 14,18, 27,28	1,15
Prince Georges:		13,14,18, 28,31	3	10,11,15, 24,25	2,3, 11,31	10,18, 24,27	
Queen Annes:		11,23		11,31	1,6,7, 22	24,26	
Somerset:		7,27	1	30	6		
St. Marys:		22					
Talbot:	30			17	17	14	15
Washington:		18,24		22		21,28	4
Wicomico:	28	3,9,11,15, 18,25,31	2,12, 17,29	7	2,26	6,7,19	4,12, 15,19
Worcester:		7,10	21			13,25,27	6,27

Maryland host plants: Circium arvense, C. vulgare, Helianthus Ambrosia trifida L., Ambrosia sp., Aster spp., Solidago spp., Bidens sp., Lactuca canadensis L., and unidentified herbaceous plants.

Genus Publilia Stal

Key to the Maryland species of Publilia

1. Lateral view of distal half of pronotum with strong reticulations forming a network.....reticulata
   Pronotum without reticulations, having instead several longitudinal rugae (ridges).....concava

Publilia reticulata Van Duzee 1908

This is a very uncommon insect in Maryland. Nationally it has been recorded only from a relatively narrow band from Pennsylvania and New Jersey, south to North Carolina and extending west into South Dakota to Oklahoma. Very little is known about the life history of this membracid anywhere in its range. Recorded hosts include Veronia baldwini and Aster spp.

Maryland seasonal distribution: 28 April - 24 September.

Maryland county records:

	April	May	June	July	August	September
Allegany:			25			24
Anne Arundel:				27		
Montgomery:	28	15,30		7	22	

Maryland host plants: unknown but both Veronia and Aster occur in Maryland.

Publilia concava (Say) 1824

This i evidently the first record of this insect for Maryland. Its presence has been suspected since it is found in Pennsylvania and Virginia. Its range extends throughout the eastern half of the nation except the deep south and can be found as far west as a line from North Dakota into Texas. Washington State and Utah are also, surprisingly, represented. It has also been collected in Ontario, Canada. The literature states that the adult overwinters and there are several generations per year. Nymphs are gregarious and the aggregates are tended by ants. Host plants include Ambrosia trifida, Solidago sp., Helianthus sp., "thistle" (probably Circium sp.), Melilotus sp., and Silphium

perfoliatum.

Maryland seasonal distribution: 15 May - 1 September.

Maryland county records:

	May	June	July	August	September
Garrett:	15	5-7			
Washington:					1

Maryland host plants: Unknown, but recorded hosts are present in Maryland.

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THE EMPEROR AND REGAL MOTHS (LEPIDOPTERA: SATURNIIDAE) OF MARYLAND

Robert S. Bryant

Of all the families of moths that can be found in Maryland, undoubtedly the one that is familiar to the most people, collector and noncollector alike, is the Saturniidae which includes the widely divergent subfamilies Saturniinae, Hemileucinae and Citheroniinae. Many species in these groups attract attention with their wild and erratic actions when flying in proximity to electric light and with their large size and bright colors.

The first attempt to catalog and illustrate the Maryland saturniids was made by the newly formed Natural History Society of Maryland, but there were only eleven species listed in that 1930 publication. Since then, extensive collecting by numerous individuals has brought the total up on a par with other East Coast states where the saturniids have been reported. Pennsylvania (Tietz, 1952) and New Jersey (Smith, 1910) both claim 15 species, Connecticut (Britton, 1920) checks in with 14 and Florida (Kimball, 1965) boasts 16. Sixteen species have

also been recorded for Maryland, although one of those, Sphingicampa bicolor (Harr.), is only tentative at this point. Nearly 30 years ago, Frank Chermock gave the author a box full of moldy, dermestid riddled specimens that had survived, among other things, a flooded basement. What made these specimens worthy of continued preservation, instead of instant consignment to the nearest trash can, was that they were reputed to have been collected in western Maryland. In addition to a fine series of pine-feeding Zales (Noctuidae) from the Flintstone area, each with an individual printed label, there were some unmarked odds and ends supposedly from the vicinity of Frostburg where Chermock had lived for a time. The bicolor was one of the unmarked specimens. If it were not for the fact that there is a substantial amount of honey locust on the rocky slopes of Allegany County, I would be inclined to omit the record. However, since Gleditsia triacanthos L. is a primary foodplant for bicolor, and specimens have been taken in Ohio, Pennsylvania and Virginia, its occurrence somewhere in the western Maryland mountains would not be surprising and additional specimens should be sought during June and again in August.

Another of the citheroniines, Citheronia sepulcralis Grt.& Rob., though much more common than bicolor, is apparently restricted to a few areas where white pine, Pinus strobus L. and pitch pine, P. rigida Mill., the two specifically mentioned foodplants, are concentrated. Of the three areas in Maryland where this moth has thus far been recorded only the western population appears to be associated with white pine. Numerous specimens have been taken in the area roughly delineated by Warrior Mountain on the west and Sideling Hill on the east. Once again it was Chermock who collected multiple specimens of sepulcralis at lights in the town of Flintstone and at an area known as Shipways on scenic Route 40 and at the nearby, well-lighted overlook. There is so much pine in this area, landmarks bear such names as Piney Grove, Piney Plains, Piney Run and Piney Ridge. Slightly to the south and east, at Berkeley Springs, West Virginia, W.J. Holland reported the larvae as being "abundant" in July and August, around the turn of the century. More recent records by John Glaser (pers. comm.) prove that the species still resides in this locality. However, the other two areas (on both sides of Chesapeake Bay) where sepulcralis has been recorded show a preponderance of Virginia pine, P. virginiana Mill., on the Vegetation Map of Maryland (Brush,lenk & Smith, 1976). This is not specifically listed as a food of sepulcralis although pines are generally mentioned. So critical is the white pine and/or pitch pine association that even though sepulcralis has been collected in the Annapolis vicinity, (Hopkins, pers. comm.) it was not taken in six years of intense collecting a few miles west in Southaven, on the South River at its confluence with Broad Creek (Stevenson, 1992).

Of the two Maryland hemileucines, the buck moth is the most elusive. Although Hemileuca maia (Dru.) can be exceedingly numerous in some areas, its diurnal habits, spotty occurrence and late season flight period all contribute to the scarcity of records. Some colonies seem to be transitory, lasting only a few years (Bryant, 1978) while others are more permanent (Fales, 1977). Glaser (pers. comm.) has also observed a permanent colony in the Green Ridge State Forest.

Among the saturniids found in Maryland there is only one species with a severely restricted range. Samia cynthia (Dru.) seems unable to expand its range beyond the urban centers into which it was introduced, more than a century ago, in spite of the fact that the tree-of-heaven, Ailanthus altissima Swingle, its primary foodplant, is becoming established in more suburban, even rural, settings. During the more than 20 years the author spent engaged in rearing various species of saturniids from around the world, it was often necessary to have a ready breeding stock of S. cynthia advena Watson, the Americanized race of cynthia, for hybridization experiments with races from other countries. Cocoons were always readily available from collectors in New York and Philadelphia for as little as $15/100, attesting to their abundance in those cities. Baltimore, it seems, had its own thriving cynthia population though I didn't know it until after I met Chermock in 1963. One of his many interesting anecdotes dealt with collecting cynthia cocoons, from back yards, railroad tracks and vacant lots in downtown Baltimore, by the "bushel basket full". Unfortunately, my breeding cages, at home on the southwestern edge of the city, were too far from the epicenter of all this cynthia activity and my females would only attract an occasional wild male if the breeze was just right. Although the cynthia population in urban Baltimore is probably as large today as it was in Chermock's day, only one additional speci-

men has been reported since my own experiences with it in the 1960's.

The remaining 12 species of Maryland saturniids are generally distributed and fairly common wherever their foodplants grow abundantly except in areas that have been sprayed for gypsy moth. Four of these, Callosamia promethea (Dru.), Hyalophora cecropia (L.), Actias luna (L.), and Antheraea polyphemus (Cram.) were reared through one to three broods annually, for many years. Promethea and cecropia females would regularly attract 15-25 males daily during the height of their seasons. Promethea females provided a bonus in that if they were prevented from mating in the afternoon they would attract 10-15 C. angulifera (Wlk.) males at dusk. Polyphemus and luna females attracted proportionately fewer males but a significant sample was the eventual result. Even though emergences started slowly in May and there was usually a two to three week lull in July between broods, in any given year, after several years I had recorded captures of wild males for virtually every day from early May through early September. There is nothing to be gained from listing these thousands of specimens individually, so I have only listed a few representatives, for each of the five species, for Ten Hills.

Much more collecting needs to be done to fill in some of the obvious gaps, particularly in regard to the Eastern Shore counties. It is hoped that if anyone has specimens from counties not recorded here that they will report them to the author for inclusion in the next updated revision.

In the list below, the counties are arranged alphabetically and in a column, this time, to facilitate faster reference. As with earlier lists (Bryant, 1981,1982) the initials following the dates, in most cases, indicate the collector and/or the present location of the specimen. For explanation of initials consult the acknowledgements section. Entries followed by the number one, in parentheses, were reported in a back issue of Phaeton. Entries followed by the number two, in parentheses, were reported in the last issue of this journal. As was done in previous segments, this list follows the arrangement in the McDunnough check list and for reasons too complex to pursue at this time. I have, however, added the new synonymies from the Hodges check list for the convenience of anyone who may be following that new arrangement.

SATURNIIDAE
SATURNIINAE

Samia cynthia (Dru.)

BALTIMORE: Baltimore, ex pupae eclosed VI-61(RSB). Patterson Park, VI-79(APP) collected by W.Parks. Ten Hills, 6-VIII-68(RSB).

Hyalophora cecropia (L.)

ANNE ARUNDEL: Annapolis, 24 & 30-VI-78(WTH). Fairhaven, ex pupa eclosed 10-VI-73(RTM).
BALTIMORE: Baltimore, Security Blvd., 22-VI-70(RSB). Ten Hills, 11-VI-73, 24-VI-76, ex pupa eclosed VII-78(RSB), 16-VI-83(APP). Uplands Pkwy., ex pupa eclosed 11-IV-53(RSB). Catonsville-UMBC, 23-VI-73(RSB) collected by P.J.Kean. Loch Raven, 22-VI-70(RSB). Timonium, 17-V-71(WAA).
CARROLL: Eldersburg, 17-VII-81(APP).
PRINCE GEORGES: Beltsville, ex pupa eclosed 31-V-57(RTM). Bowie-PWRC, 4-VI-44, ex pupa eclosed 20-V-46, ex pupa eclosed 26-V-52, ex pupa eclosed 10-VI-52(RTM).
ST. MARYS: Oaks, 26-VI-76(RSB) collected by W.A.Andersen.

Callosamia promethea (Dru.)

ALLEGANY: Green Ridge State Forest, ex pupa eclosed 7-VI-73, ex pupa eclosed 16-VI-77(RSB). LaVale, 3-VIII-82(JDG). Rocky Gap St. Pk., 17-V-82(RSB) collected by J.D.Glaser.
ANNE ARUNDEL: Annapolis, 22-IV-80(WTH). Broad Creek, 25-VII-80(RSB) collected by P.J.Kean. Harwood, 18-VIII-84(WTH).
BALTIMORE: Baltimore, 25-V-47(WAA). Ten Hills, 9-VII-59, 9-VI-74, 1-VII-74(RSB).
CALVERT: Prince Frederick, ex pupa eclosed 19-VI-79(JDG).
CARROLL: Patapsco Reservoir, ex pupa eclosed 9-VI-74(RSB). Reese, ex pupa eclosed 17-VI-78(RSB).
FREDERICK: Ft. Detrick, 16-VIII-79(RSB) collected by W.J.Cooper.
PRINCE GEORGES: Beltsville-ARC, ex pupa eclosed 19-VI-68(RTM). Bowie-PWRC, ex pupa eclosed 11-VII-71(RTM). Croom, ex pupa eclosed

11-VI-81(JDG). Upper Marlboro, ex pupa eclosed 5-VI-81(JDG).
WASHINGTON: Deneen Rd., 12-VII-76, ex pupa eclosed 10-V-77(RSB). Seavolt Rd., ex pupa eclosed 21-V-72(RSB).

Callosamia angulifera (Wlk.)

ALLEGANY: LaVale, 24-VII-81, 20-VII-83(JDG).
ANNE ARUNDEL: Annapolis, 23-VII-78, 12-VIII-79(WTH). BWI Airport, 22-VI-80(APP).
BALTIMORE: Baltimore, Ten Hills, 2-VII-64, 10-VII-65, 25 & 26-VI-66, 19-VI-67, 9,13 & 29-VI-69, 9-VI-71, 16-VI-72, 14,15,16,19,21,22, 25 & 30-VI & 1 & 8-VII-74, 8-VII-75, 23 & 29-VIII-78(RSB). Bowleys Quarters, 13-VII-67(RSB) collected by J.Barnard. Loch Raven, 20-VI-67, 2,13,23,27 & 30-VII-70, 28-VI & 8-VII-71(RSB). Lutherville, 22-VIII-61(WAA).
CALVERT: (2)
CARROLL: Marriottsville, 23-VI-69(RSB).
FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).
HOWARD: Glenelg, V-53(RSB) collected by C.Ridgely.
PRINCE GEORGES: Bowie, 19-VII-77(JDG).
ST. MARYS: Mechanicsville, 27-VI-74(WAA). Oaks, 26-VII-73(RSB) collected by W.A.Andersen. Oraville, 24-VI-71(WAA).
WICOMICO: Fruitland, 17-VIII-76(RSB) collected by W.A.Andersen.
county unknown: Ivy Neck, 15-VIII-68 collected by B.D.Williams.

Actias luna (L.)

ALLEGANY: LaVale, 25-VII-81(JDG). Rocky Gap St. Pk., 15-VII-82(JDG).
ANNE ARUNDEL: Annapolis, 23-IV & 8-V-79(WTH). Harwood, many specimens VII & VIII-84(WTH).
BALTIMORE: Baltimore, Hunting Ridge, VI-53(RSB) collected by J. Thayer. Ten Hills, 18-V-66, 8-VII-83, 6-IX-89(RSB). Catonsville, 25-IX-55(RSB). Catonsville-UMBC, 28-VIII-79(APP) collected by L.MacKay. Loch Raven, 4-VIII-69, 5 & 11-VI & 2,6.13 & 27-VII-70, 14-VI & 8-VII-71(RSB). Parkton, 24-VII-87(FWH).
CALVERT: (2)
CARROLL: Camp Hashawa, 29-IV-79(A.Davis). Reese, 29-VII-67(RSB).
CECIL: Northeast, 3-V-69(RTM).
FREDERICK: Thurmont, 4-VII-49(WAA).
GARRETT: Bittinger, 27-VI-61(RTM).
HARFORD: Aberdeen, 22 & 24-VIII-74(RTM).
HOWARD: West Friendship, VI-70(APP) collected by C.Liggett.
PRINCE GEORGES: Bowie-PWRC, 29-VIII-42, 12,22 & 28-VII & 4-IX-43, 20-IV-45, 2-IV & 15-V & 21-VIII-46, 31-VIII-61, 8-V-63, 2-VIII-66, 2,7,8,17,18,25 & 28-VIII-67, 21-IV-69, 17-VI & 15-VII-70, 20-VIII-71, 19-IV-72(RTM). Greenbelt, 6-V-61(RTM).
ST. MARYS: Park Hall, 1-VIII-80(RSB) collected by P.J.Kean.

Antheraea polyphemus (Cram.)

ALLEGANY: Green Ridge St. For., 17-VII-80(RSB) collected by P.J.Kean. LaVale, 25-VII-81, 3-VIII-82(JDG). Rocky Gap St. Pk., 10-VII-82 (JDG).
ANNE ARUNDEL: Annapolis, 17-VII-78, 8-VI-79(WTH). Broad Creek, 25-VII-80(RSB) collected by P.J.Kean. Harwood, 20-VIII-84(WTH).
BALTIMORE: Baltimore, 7-VII & 1-VIII-47(WAA). Security Blvd., 6-VIII-69(RSB). Ten Hills, 10-VII-60, 18-VIII-70, 8-VI-71, 14-V-79, 16-V-83(RSB). Uplands, VI-53(RSB) collected by D.Patterson. Catonsville-UMBC, 15-VII-85(APP). Loch Raven, 11-VI & 23 & 27-VII-70 (RSB). Owings Mills, 30-VI-67(RSB).
CALVERT: (2)
CARROLL: Westminster, 17-VIII-67(RSB) collected by B.Groff.
FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).
GARRETT: Bittinger, 27-VI-61(RTM). Grantsville,12-VII-85(E.Cohen)(1)
PRINCE GEORGES: Bowie-PWRC, 13 & 29-VII & 3-VIII-43, 15 & 20-V-46, 22-IV-54, 4,18,24 & 25-VIII-67, 4-VI-69, 20-VIII-71(RTM).

HEMILEUCINAE

Automeris io (F.)

ALLEGANY: Corriganville, 26-VII-77(JDG). Green Ridge St. For., 6-VII-82(RSB) collected by J.D.Glaser. LaVale, 6 & 7-VII-82(RSB) collected by J.D.Glaser. Rocky Gap St. Pk., 10-VII-82(RSB) collected by J.D.Glaser.

ANNE ARUNDEL: Annapolis, 2 & 11-VII-79(WTH). Broad Creek, 25-VII-80 (RSB) collected by P.J.Kean. Fairhaven, 3-VIII-70(RTM).
BALTIMORE: Baltimore, 1-VIII-47, 25-VI-48, 27-VI-50(WAA). Ten Hills, 21-VII-80(RSB). Gwynn Oak, 27-VI-66(RSB) collected by F.H. Chermock. Loch Raven, 26-VI-69, 6 & 13-VII-70, 28-VI-71(RSB). Lutherville, 17 & 18-VI-62(WAA).
CALVERT: (2)
CARROLL: Marriottsville, 24-VI-69(RSB).
HOWARD: Evergreen Valley, VII-74(RSB) collected by R.Nagle.
PRINCE GEORGES: Bowie-PWRC, 12-V & 14-VII-44, 15-VII-61(RTM). University Pk., 2-VII-69(RTM).

Hemileuca maia (Dru.)

ALLEGANY: Green Ridge St. For., X & XI(JDG).
CALVERT: MacKall, 28-X-82(J.D.Glaser, sight record)(1). St. Leonard, 8-XI-83(JDG).
CARROLL: Reese, X(RSB)(2)
DORCHESTER: DeCoursey Bridge, 26-X-84(PJK)(1)
MONTGOMERY: Sugarloaf Mtn., 18-X-65(RTM).
PRINCE GEORGES: Beltsville-ARC, X & XI(JHF)(2)
WICOMICO: Salisbury, X & XI(RSB)(2)

CITHERONIINAE

Anisota stigma (F.)

ALLEGANY: Rt.40 at Divide Rd., 17-VII-80(RSB) collected by P.J.Kean.
ANNE ARUNDEL: Millersville, 27-VII-83(JDG).
CALVERT: (2)
PRINCE GEORGES: Bowie-PWRC, VI-41, larvae found 14 & 28-IX-42(RTM). Bowie, 11-VII-79, 20-VII-82(JDG).
ST. MARYS: Oaks, 26-VII-73(RSB) collected by W.A.Andersen, 1-VIII-74(RSB) collected by W.A.Andersen.

Anisota senatoria (J.E.Sm.)

ALLEGANY: Green Ridge St. For., 2-VII-77(RSB), 6-VII-82(RSB) collected by J.D.Glaser.
ANNE ARUNDEL: Broad Creek, 25-VII-80(RSB) collected by P.J.Kean.
BALTIMORE: Eklo, ex larva, eclosed 23-X-63(RSB) collected by F.H. Chermock.
PRINCE GEORGES: Bowie-PWRC, 20-V-44, 20-VI-45, larvae found 1 & 17-IX-42(RTM).

Anisota virginiensis (Dru.)

ALLEGANY: LaVale, 6-VII & 2-VIII-82, 20-VII-83(JDG). Rocky Gap St. Pk., 21-VII-80, 15-VI-83(JDG).
ANNE ARUNDEL: Rhode River, 22-VI & 18-VII-80(WTH). Shady Oaks, 7-VIII-84(WTH).
BALTIMORE: Loch Raven, 2-VII-70(RSB).
CALVERT: (2)
CARROLL: Reese, ex larva, eclosed 5,8,10,13,25-VI & 1-VII & 20-IX-69(RSB).
HOWARD: Woodbine, VIII-61(RSB) collected by S.Dobbs.
PRINCE GEORGES: Bowie-PWRC, 12-VII-44, larvae found 23-VII-73(RTM).
WORCESTER: Shad Landing, 28-VI-83(JDG).

Dryocampa rubicunda (F.)

ALLEGANY: Dans Mt., 9-V-83(JDG). LaVale, 1-VIII-78, 7-VII-82(JDG). Rocky Gap St. Pk., 18-V & 21-VII-82, 26-V-83(RSB) collected by J.D.Glaser.
ANNE ARUNDEL: Annapolis, 12-V & 25-VII-79(WTH). Shady Oaks, 7-VIII-84(WTH).
BALTIMORE: Loch Raven, 4 & 7-VIII-69, 5,11,17 & 22-VI-70, 21 & 28-VI-71(RSB). Towson, 27-VI-50(WAA).
CALVERT: (2)
CECIL: Northeast, 1-VI-69(RTM).
FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).
HARFORD: Edgewood Arsenal, 1-VII-76(RSB) collected by W.A.Andersen.
PRINCE GEORGES: Bowie-PWRC, 23 & 28-VII-43, 19-V & 14-VII-44, 26-VII-45, 20 & 21-V-46, 6-VI-61(RTM). Greenbelt, 18-IV-45(RTM) at light.
QUEEN ANNES: seen at Stevensville, (RTM).
WASHINGTON: Sideling Hill, 8-VII-67(RSB).

Sphingicampa bicolor (Harr.)

ALLEGANY: Frostburg, (RSB) collected by F.H.Chermock.

Citheronia regalis (F.)

ANNE ARUNDEL: Annapolis, 11-VII & 4-VIII-79(WTH). Harwood, many specimens, late VII (WTH).
BALTIMORE: Baltimore, Ten Hills, VII-71 & VII-80(RSB). Eklo, 20-V-48(WAA). Loch Raven, 6,16,20,27 & 30-VII-70(RSB).North Bend, 25-VII-62(RSB) collected by A.N.Ferguson. Parkton, 18-VII-87(FWH). Reisterstown, VII-74(RSB) collected by J.Barnard. Rolling Road G.C., VIII-63(RSB) collected by S.H.Bryant. Timonium, 29-VI-76 (RSB) collected by Bill Andersen.
CALVERT: (2)
CARROLL: Marriottsville, 17-VII-68(RSB) collected by A.Wilhide.
HARFORD: Edgewood, 7-VII-82(JDG).
HOWARD: Woodbine, VIII-61(RSB) collected by S.Dobbs.
PRINCE GEORGES: Beltsville-ARC, 15-VII-69(RTM). Bowie-PWRC, 27-V-44, ex larva, eclosed 22-VI-60, 14-VIII-71, 12-VII-74(RTM). Hyattsville, 29-VII-62(RTM). Laurel, 27-VII-79(RSB) collected by M. Brooks.

Citheronia sepulcralis Grt. & Rob.

ALLEGANY: Flintstone, 1-VIII-62(RSB) collected by F.H.Chermock. Green Ridge St. For., 4-VII-90(JDG). Warrior Mt., 22-VII-88(JDG).
ANNE ARUNDEL: Annapolis, 17-VIII-78, 21-VI-80(WTH).
DORCHESTER: Vienna, 14-VI-90(JDG).
ST. MARYS: Lexington Pk., 18,23 & 29-VI & 8,15 & 16-VIII-74, 24 & 26-VI-75 collected by J.Haliscak. Oaks, 27-VI-74(WAA). Park Hall, 10-VII-83(PJK).

Eacles imperialis (Dru.)

ALLEGANY: Green Ridge St. For., 6-VII-82(RSB) collected by J.D. Glaser. LaVale, 25-VII-79(JDG).
ANNE ARUNDEL: Annapolis, 16-VII-77, 25-VII-79(WTH). Broad Creek, 25-VII-80(RSB) collected by P.J.Kean. Harwood, many specimens, VII & VIII (WTH).
BALTIMORE: Baltimore, 4-VIII-47, 25-VI-48(WAA). Loch Raven, 4-VIII-69, 16,23,27 & 30-VII-70(RSB). McDonough, VII-58(RSB). Parkton, 18 & 24-VII-87(FWH).
CALVERT: (2)
HOWARD: Rt.40 nr. St. John's Lane, VIII-60(RSB).
PRINCE GEORGES: Bowie, 20-VII-77, 8-VII-82(JDG). Bowie-PWRC, 28-VII-43, 27-VII-59, 29-VII-60, 20-VII-64, 1-VIII-66, 19 & 23-VII & 3, 9 & 17-VIII-67, 20 & 22-VIII-71(RTM). Greenbelt, 30-VII-61(RTM).
county unknown: Maple Hall, VII-53(RSB) collected by A.Plitt.

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PUPAL CASES OF THREE SPECIES OF MACHIMUS LOEW IN MARYLAND (DIPTERA: ASILIDAE)

A. G. Scarbrough and T. P. Kuhar

Robber flies of the genus Machimus Loew consist of a holarctic group of predaceous flies which, because of their size and voracious appetite, are presumably significant factors in the regulation of insect populations in natural habitats. The adults, being moderate to large in size and often showy and conspicuous, have long attracted the attention of collectors, and are therefore, reasonably well known taxonomically. At least 31 species have been described from North America (Martin 1975, Bullington & Peck 1991). Twelve species are reported from Maryland (Martin & Wilcox 1965, Martin 1975, Scarbrough and Kuhar in mansc.). However, aside from a general knowledge of the life history gleaned from scattered observations on a relatively small number of species, little in depth knowledge exists on the immature stages of species of this genus or related genera. The immature stages presumably develop in soil habitats (Knutson 1972). The pupa of only

four species [M. (=Asilus) virginicus (Banks) and M. (=Asilus) notatus (Wiedemann) (Fattig 1944) in North America and M. (=Asilus) atricapilus Fallen and M. (=Asilus) gonatistes Zeller in the U.S.S.R. (Zinov'eva 1959), and a species in a related genus, Neomochtherus (=Asilus) angustipennis (Hine) (Knutson 1972)] have been described. Moreover, only one to two percent of the immature stages of all insects have been described (Kosztarab and Schaefer 1990).

In conjunction with another study of Maryland asilids, we located the pupal cases, with attached emergent adults, of M. erythocnemius (Hine), M. paropus (Walker) and M. snowii (Hine). Noting that the pupae are unknown to science, we present descriptions and illustrations of the pupae of each species, and the seasonal and geographic distributions of the adults. Because these three species are so similar and to save space and to reduce redundancy, a detailed description and illustrations of the pupa of M. snowii are given in detail, whereas only significant differences are presented for the other two species. Characters not mentioned otherwise are similar to those described for M. snowii.

Machimus snowii (Hine)

Asilus snowii Hine, 1909: 160.
Tolmerus snowii (Hine), Hull 1962: 572; Martin & Wilcox 1965: 401.
Machimus snowii (Hine), Baker & Fischer 1975: 82.

Description of pupa: Length (including anterior antennal processes) 15-16.7 mm; greatest width of thorax 3.3-3.8 mm; greatest width of abdomen 3.5-3.7 mm; greatest width of last abdominal segment 1.7 mm. Surface subshiny yellow with a slight tint of brown; spine-like bristles, spines and processes yellowish brown to reddish brown.

Head (Fig. 1): A pair of horn-like anterior antennal processes (aap) present apically, and a group of 3 basally fused posterior processes (pap; Fig. 2) ventrolaterally on each side, the second and third processes two-thirds to three-fourths distance between the first and second processes; each process flattened apically and wide in lateral view; second and third process subequal in length to the first; apex of each process rounded, subtruncate; third process slightly curved anteriorly. Basal half or more of aap and pap rugose. Labial sheath (ls) with a minute raised beaklike process, its surface and the flattened plate on each side rugose. Hypopharyngeal sheath (hs) smooth, projecting as a rounded point medioposteriorly, its margins thickened and raised forming a shallow median depression. Maxillary (ms) and anterior coxal sheaths (acs) entirely smooth; anterior coxal sheaths longest medially; area bordered laterally by prothoracic legs and posterior margin of anterior coxal sheaths cardiform.

Thorax (Fig. 1): Paired thoracic spiracles reniform, each surrounded by a ring of dark cuticle and situated midlaterally on a low mound at the anterior margin of the thorax. Base of middle leg sheath with a pair of spines (amsp; Fig. 3), apices acute; anterior spine moderately hooked with anterior surface gradually recurved, subequal in length but about same basal width in dorsal view as posterior spine; posterior spine elongatedly triangular; surface of sheath at base of spines wrinkled or rugose. Base of each wing sheath (ws) with a short posterior mesothoracic spine (pmsp) on a raised mound or tubercle, surface of mound ringed rugose or wrinkled; thorax otherwise smooth. Sheath of third pair of legs reaching middle of abdominal segment 3.

Abdomen (Fig. 1): Tergite 1 (t1) with a transverse row of 10 long, thick spine-like bristles, each slightly proclinate on apical one-fourth to one-third, plus one thinner, shorter, straight bristle at each end of row, short bristle about one-half length of longer bristles; each reniform spiracle with four yellow setae posteriorly, sternum 1 obscure. Tergite 2 with a transverse row of 15 flat, wide tooth-like, straight bristles (6 long and 9 short bristles), alternating one or two, rarely three, short and one long bristle, each bristle shorter but wider than those of tergite 1; a row of short, thin, yellow setae present laterally; pleuron with a row of five-six setae behind each spiracle; sternite 2 with an incomplete row of setae, seven present on each side; setae of pleuron and sternum longer and thicker than those on tergite laterally. Tergites 3-7 differ from tergite 2 as follows: the paired short bristles are sometimes fused in part or entirely and reduced in size on the posterior tergites; groups of two or three short bristles are absent beyond

tergite 5, tergite 7 has only three short bristles; the setae on all segments become slightly thicker posteriorly, and sternites 3-7 have complete rows of yellow setae. Abdominal segment 8+9 ? with only four short bristles dorsally (Fig. 4), each about one-third length of bristles on tergite 7; pleuron and sternum (Fig. 5) with a row of six setae, the sternal setae short and weak, about one-fifth length of pleural setae. Apex of segment 8+9 ? with four thick processes, base of each dorsolateral process (Figs. 6, 7) wide, about three-four times the width of the apical one-third, apex pointed; the ventrolateral process (Figs. 7, 8) short, about one-half the length of the dorsolateral pair; both pair of processes slightly curved subapically; a short digitate pair of processes present medioventrally between the bases of the ventrolateral pair of processes. Ventral surface of abdominal segment 8+9 ? with a pair of small semidome-like processes medially.

Remarks: The specimens in the University of Delaware Collection are labeled, "New Castle, Del., Donald MacCreary Collection", and the dates 7/23/35 and VII/8/35. One specimen also has an identification label with the name "Asilus snowii Hine, det. Stanley Bromley, 1937." Both adults are males and are in excellent condition with only the third antennal segment missing in both specimens, and one lacks a portion of the fore and hind legs. The abdomen of the pupal case with the date VII/8/35 is partially covered with sand.

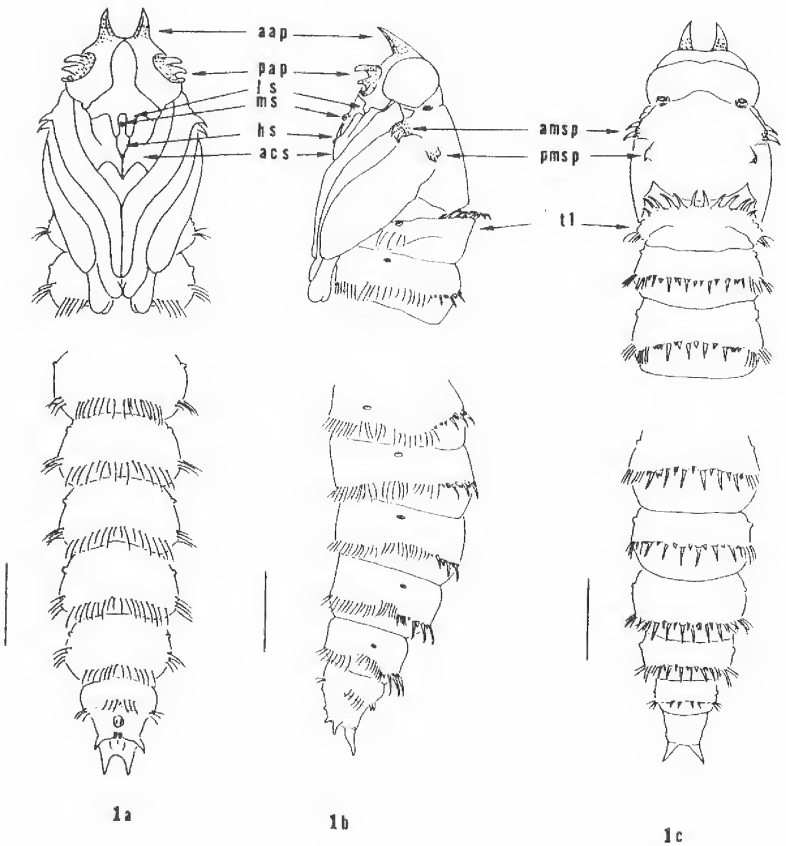
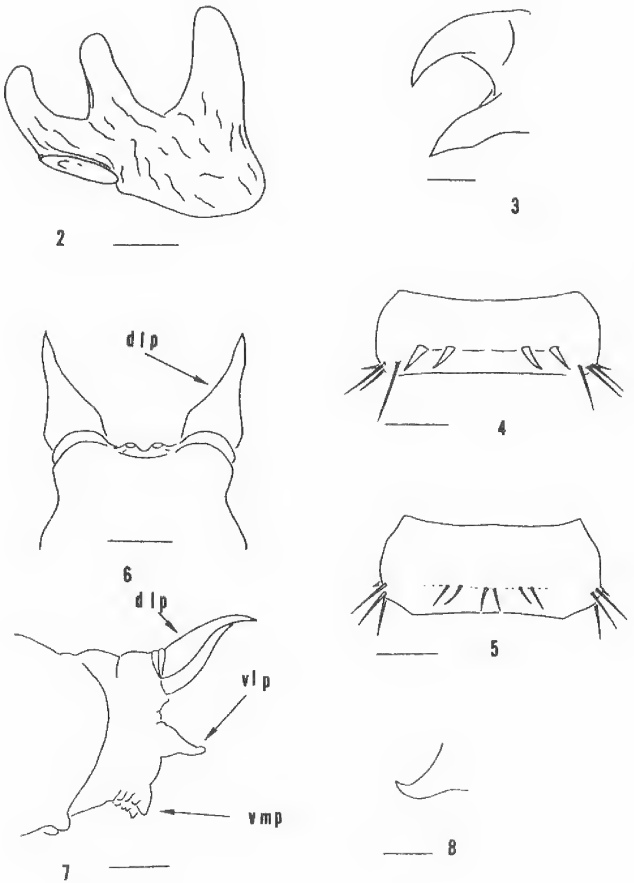


Figure 1. Pupa of Machimus snowii, male. 1a. ventral view, 1b. lateral view, 1c. dorsal view. Scale: a-c = 2.0 mm.



Figures 2-8. Pupal structures of Machimus snowii, male. 2. right posterior antennal process (pap), 3. left mesothoracic spines (amsp), 4. vestiture of tergite 8, 5. vestiture of sternite 8, 6. dorsolateral processes (dlp) of segment 8+9?, dorsal view, 7. dorsolateral (dlp), ventrolateral (vlp) and ventromedial processes (vmp) of segments 8+9?, lateral view, 8. left ventrolateral process. Scale: Figs. 2-7 = 0.3 mm, Fig. 8 = 0.1 mm.

The pupal cases of Machimus snowii, M. erythocnemius, M. paropus and Neomochtherus angustipennis are similar in color and general characters but the former may be identified by the following characters: apices of pap rounded, a row of 12 spine-like bristles on tergite 1, wide, tooth-like spines on tergites 2-7 and stout apical processes on segments 8+9.

Flight season: 3 June to 3 Sept.; geographic distribution by states: CN, IL, KA, MA, MD, MI, MO, NH, NY, OH, PA, SD (Hine 1909, McAtee and Banks 1920, Bromley 1946, Martin and Wilcox 1965, Baker and Fischer 1975).

Distribution records of M. snowii in Maryland by county: Baltimore, Cecil, Montgomery, Prince Georges.

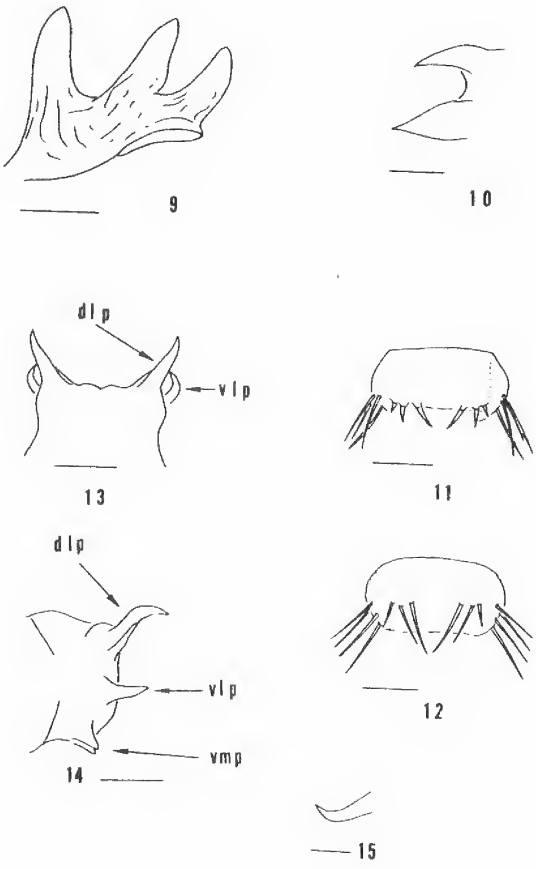
Machimus erythocnemius (Walker)

Asilus erythocnemius Hine, 1909: 163; Martin & Wilcox 1965: 392. Machimus erythocnemius (Hine), Baker & Fischer 1975: 77.

Description of pupa. Length 10.2-15.0 mm; greatest width of thorax 2.3-3.5 mm; greatest width of abdomen 2.3-3.5 mm tapering to 0.7-1.2 mm.

Head: Apices of pap pointed (Fig. 9), not acuminate, distance between first and second process about twice that between second and third process.

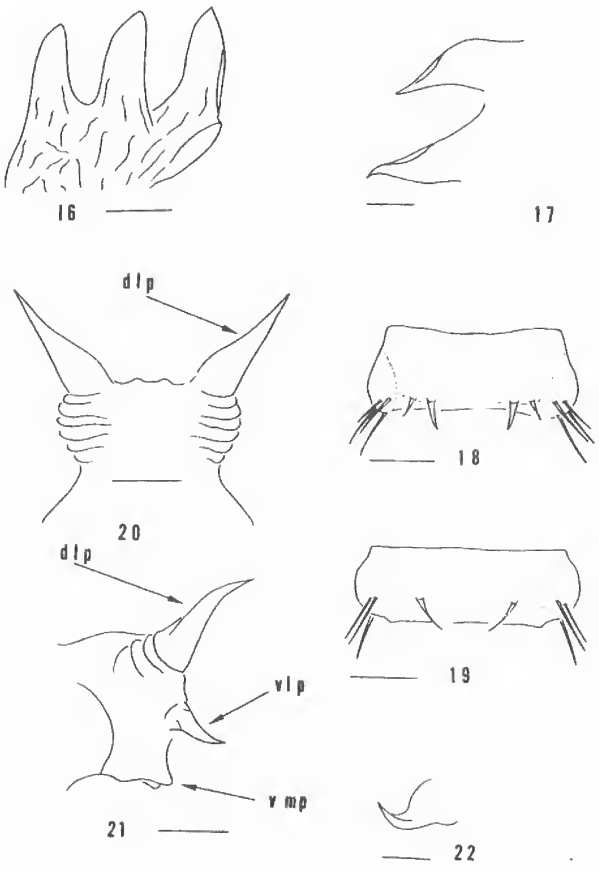
Thorax: Anterior spine of amsp (Fig. 10) slightly more narrow than posterior spine, slightly hooked, apex acuminate; posterior spine triangular in dorsal view, clearly wider basally, anterior margin somewhat more angular than posterior margin. Apex of third pair of legs



Figures 9-15. Pupal structures of Machimus erythocnemius, female. 9. left posterior antennal process (pap), 10. left mesothoracic spines (amsp), 11. vestiture of tergite 8, 12. vestiture of sternite 8, 13. dorsolateral processes (dlp) of segments 8+9?, dorsal view, 14. dorsolateral (dlp), ventrolateral (vlp) and ventromedial (vmp) processes of segments 8+9?, lateral view, 15. left ventrolateral process. Scale: Fig. 9 = 0.3 mm, Fig. 10 = 0.2 mm, Figs. 11-14 = 0.5 mm, Fig. 15 = 0.1 mm.

extending to middle of sternite 3.

Abdomen: First abdominal tergite with a row of 10 elongate, slightly proclinate, flat spine-like bristles plus one short bristle at one or both ends of the row, short bristle about one-third the length of longer bristles. Tergite 2 with a row of 13 bristles, a long bristle alternating with a short bristle, and none occurring in pairs; short bristles about one-half length of longer bristles, and none occurring in pairs. The longer bristles more slender and longer than those of M. snowii. Vestiture of tergites 3-6 same as tergite 2 except the median apically notched bristle is absent. Tergite 7 with six long bristles, the middle three alternating with shorter bristles, length of shorter bristles one-fourth to one-third as long as longer bristles; spaces between remaining long bristles without bristles or if present then as small pointed mounds. Tergite 8+9? (Fig. 11) with a



Figures 16-22. Pupal structures of Machimus paropus, female. 16. left posterior antennal process (pap), 17. left mesothoracic spines (amsp), 18. vestiture of tergite 8, 19. vestiture of sternite 8, 20. dorsolateral processes (dlp) of segments 8+9?, dorsal view, 21. dorsolateral (dlp), ventrolateral (vlp) and ventromedial (vmp) processes of segments 8+9?, lateral view, 22. left ventrolateral process. Scale: Figs. 15-21 = 0.3 mm, Fig. 22 = 0.1 mm.

group of two or three short, thick bristles on each side of middle, the two admedial bristles slightly thicker and longer than other bristles; sternite 8 (Fig. 12) with a group of three rather thick setae laterally, each group separated by a wide space medially; the inner most setae very long, about one-half length of segment 8, the remaining setae one-eighth to one-sixth length of segment 8; the pleural setae about same length and thickness as the ventral setae. All pleural and sternal setae of segments 1-8 as long as or longer than the longest dorsal bristles of the corresponding tergite; segment 9 (Figs. 13-15) with four processes, each with acuminate apex and slightly to moderately hooked admedially; basal width of dorsolateral process 1.5-2 times the apical width; two short, digitate, median processes present between bases of ventral processes; two low, smooth, mounds present ventro-medially.

Remarks: Two pupal cases of M. erythocnemius with pinned teneral adult females are in the USNM collection. One pupa is accompanied with the labels "Agawam, Mass., 17.VI.15, No. 915347, W. Springfield, H.E. Smith," and was largely covered with soil. The other specimen is accompanied with similar data except "24.VI.15, No. 915338, W.R.Walton Collection", and is free of soil.

Machimus erythocnemius is similar to M. paropus but can be distinguished by a wider spacing between the second and third process of the pap, a row of eleven or twelve bristles on tergite 1, only single short bristles alternating between longer ones on tergites 2-7, and 6 setae on sternite 8. Pupae of M. paropus differ in that the spacing between each pap process is equal to subequal, there are only ten bristles on tergite 1, pairs of short bristles often alternate with longer bristles on tergites 2-7, and sternite 8 has only 2 admedial bristles. These species also differ slightly in the apical processes of segment 8+9?.

Flight season: 21 May to 26 Sept.; geographic distribution by state: CN south to VA, and west to CO and MT (Baker & Fischer 1975, Bromley 1946, Hine 1909, Martin & Wilcox 1965, McAtee & Banks 1920; USNM, UOD, NHSM, MSDA, TSU collections).

Distribution records of M. erythocnemius in Maryland by county: Anne Arundel, Baltimore, Montgomery, Talbot.

Machimus paropus (Walker)

Asilus paropus (Walker). Hine, 1901: 161.
Tolmerus paropus (Walker). Hull, 1962: 572; Martin & Wilcox, 1966: 401.
Machimus paropus (Walker). Baker & Fischer, 1975: 81.

Description of pupa. Body length 14.6 mm; greatest width of thorax 3.7 mm; greatest width of abdomen 3.5 mm tapering to 1.9 mm in the last segment.

Head: Apices of pap (Fig. 16) pointed, not acuminate; distances between three processes equal to subequal.

Thorax: Anterior process of amsp (Fig. 17) curved posteriorly with posterior margin slightly to strongly convex, apex acuminate; posterior spine triangular with posterior margin almost straight from base to apex whereas anterior surface angular near base tapered obliquely to tip as a right-angle triangle. Apex of third pair of legs just beyond anterior margin of sternite 3.

Abdomen: Tergite 1 with 10 long, flat, slightly posteriorly curved, thick spine-like bristles; one greatly reduced bristle present at each end of row as low mounds. Tergites 2-7 with a transverse row of six long bristles, alternating with shorter bristles; the shorter bristles one-fifth to one-fourth as long as longer bristles, often in pairs (one-four pairs per row) between longer bristles and/or fused together, producing a short bristle with a wide base and a notched apex; the short bristles also become reduced in length and width in the more posterior tergites, especially between the more lateral long bristles. Tergite 8 (Fig. 18) with five widely spaced dorsolateral bristles, each shorter than bristles on anterior tergites; pleuron with four to five thin setae. Sternite 8 (Fig. 19) with two thick ventro-lateral setae, both shorter than pleural setae, slightly curved ad-medially. Dorsolateral processes of segment 8+9? (Figs. 20,21) weakly curved downward with acute apices in lateral view; each process thick and wide basally with outer margin gently tapered to apex; basal width

of process four to five times apical width. Ventrolateral process (Figs. 21-22) short with a wide, thick base, apical one-half greatly narrowed, strongly curved admedially; two erect finger-like processes between bases of ventrolateral processes.

Remarks: A single pupal case pinned with a teneral female adult exists in the USNM. The case was originally covered with soil, but most of it was removed for study. The specimen is accompanied by the following data: Agawan, (sic) Mass., 20.VI.15, W. Springfield, H.E. Smith Coll., No. 915348. The pupal case of this species is most similar to M. erythocnemius but can be recognized by the illustrated characters and the characters discussed in the remark section under M. erythocnemius.

Flight season: 16 June to 3 Oct.; geographic distribution by state: CN south to VA and west to WY and CO (Baker and Fischer 1975, Bromley 1946, Hine 1909, McAtee and Banks 1920; USNM, NHSM, TSU, PAS collections).

Distribution records of M. paropus in Maryland by county: Baltimore, Prince Georges, Queen Anne's.

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CHECK LIST OF THE MARYLAND NOTODONTIDAE, LYMANTRIIDAE, LASIOCAMPIDAE, BOMBYCIDAE AND APATELODIDAE

Robert S. Bryant

This fifth segment of the list of the moths of Maryland incorporates five, mostly small families. In fact, except for the Notodontidae, there are only a few species in each of the families, listed in the title, that may be found within our borders. Some are common and/or widespread, such as Malacosoma americanum (F.) and Heterocampa guttivitta (Wlk.), while others may be scarce and/or local, such as Odontosia elegans (Stkr.) and Hyparpax aurora (J.E.Sm.), but most are easily obtainable after a few years of collecting. However, two species, both connected with sericulture, deserve special comment. One, because it is never found in the wild, while the other has spread throughout the state and is often sufficiently numerous to be damaging to the timber industry.

The sole representative of the Bombycidae for Maryland, as it is for the entire country, is Bombyx mori L. Although this, originally Chinese, moth is only found in domestication, it is included here not only because I have reared it many times from eggs obtained from breeders both in the U.S. and abroad but because it has been included in every national check list at least as far back as 1903 (J.B. Smith). I'm not sure what the rationale is for listing a foreign species that is not found in, and cannot escape to, the wild but if the criterion is based on the fact that it is raised here, both in and out of the laboratory, as vaguely stated by Franclemont (1973), then it would seem that most of the exotic silk moths, or indeed almost any foreign species that is reared by breeders and hobbyists, might qualify for inclusion.

The other foreign moth, this one a lymantriid, and much more economically important than B. mori, was also introduced to the North American continent about 125 years ago. The now infamous gypsy moth, Lymantria dispar (L.), after a failed attempt to incorporate it into the silk industry, escaped (or was released) into the wild, in Massachusetts, in 1869. Exactly 100 years later, the first Maryland male was captured in a pheromone trap in northern Cecil County. In 1971, the first egg masses were discovered in Cecil and Kent Counties and by 1973 I was beginning to get males at black light in my back yard on the southwestern edge of Baltimore City. Since the mid 1970's the moths have been seen and/or collected, in ever increasing numbers, each year at this locality. I now have records for every day from late June through early August and, therefore, in the list that follows, I have only included a few representative dates, from random specimens, from each decade. The Maryland Department of Agriculture has been monitoring this scourge from the outset and they have confirmed its presence in all 23 Maryland counties though I only list those records with which I am personally familiar.

In the list below, all dated specimens are contained in the Maryland Moth Survey collection regardless of the collector named. Except for a few specimens that were donated, more than a decade ago, virtually nothing has been reported to this author since. It is hoped that if anyone has species or county records not mentioned here, that they will pass the information along to me so that this list can be updated in a timely manner.

Entries followed by the number one in parentheses were reported in the last issue of the Maryland Entomologist. The entry followed by the number two in parentheses is information obtained from the Maryland Gypsy Moth Newsletter. Although this list follows the arrangement in the McDunnough check list, the nomenclature has been updated to reflect that used by Covell, Hodges and other contemporary authors.

NOTODONTIDAE

Clostera inclusa (Hbn.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 31-V-69, 21-V & 28-VII-70, 5-VIII-75, 12-IV-77 & 15-VIII-80. Loch Raven, 11-VI-70.
CALVERT: (1)

Clostera albosigma Fitch

ANNE ARUNDEL: (1)

WASHINGTON: Deneen Road, 26-IV-81.

Datana ministra (Dru.)

ANNE ARUNDEL: (1)
CALVERT: (1)

Datana angusii Grt.& Rob.

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, VIII-62 & 22-VI-81. Loch Raven, 16-VII-70 & 8-VII-71.
CALVERT: (1)

Datana drexelii Hy. Edw.

ANNE ARUNDEL: (1)
CARROLL: Reese, 28-VII-72.

Datana major Grt.& Rob.

ANNE ARUNDEL: Sherwood Forest, VI-61.

Datana perspicua Grt.& Rob.

ANNE ARUNDEL: (1)
CALVERT: (1)

Datana integerrima Grt.& Rob.

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 7-VII-64, 25-VI-65, 3-VII-66, 7 & 12-VII-68, 9-VIII-71, 13-VII-72, 28-VI & 21-VII-73, 13-VII & 5 & 23-VIII-81, 1-VII-82 & 8-VII-84. Loch Raven, 6-VII-70 & 28-VI-71.
CALVERT: (1)

Datana contracta Wlk.

ANNE ARUNDEL: Sherwood Forest, 21-VII-64.
CARROLL: Reese, 28-VII-72.

Hyperaeschra georgica (H.-S.)

ALLEGANY: Rocky Gap St. Pk., 10-VI-83 collected by J.D.Glaser.
ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 29-VII-73.
CALVERT: (1)

Odontosia elegans (Stkr.)

BALTIMORE: Loch Raven, 6-VIII-69.

Peridea ferruginea (Pack.)

ANNE ARUNDEL: (1)
CALVERT: (1)

Peridea angulosa (J.E.Sm.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 18-VII-72, 23-VI & 29-VIII-73, 3-VII-76 & 4-VIII-80. Loch Raven, 6-VII-70. Stevenson, 15-VI-59 collected by F.H.Chermock.
CALVERT: (1)
ST. MARYS: Oaks, 23-VIII-73 collected by W.A.Andersen.

Nadata gibbosa (J.E.Sm.)

ANNE ARUNDEL:(1)
BALTIMORE: Baltimore, Gwynn Oak, 20-VI-65 collected by F.H.Chermock. Ten Hills, 10-VIII-64, 7-VIII-65, 28-V & 21-VI-66, 6-VIII-69, 21-V & 22-VII-70, 5-VI-73, 20-VII-76 & 25-VI-80. Catonsville, 10-VIII-65. Loch Raven, 6-VII-70 & 28-VI-71.
CALVERT: (1)
ST. MARYS: Oaks, 23-VIII-73 & 27-VI-74 collected by W.A.Andersen.

Nerice bidentata Wlk.

ALLEGANY: Rocky Gap St. Pk., 27-V-83 collected by J.D.Glaser.
ANNE ARUNDEL: (1)

BALTIMORE: Baltimore, Ten Hills, 14-VIII-68, 6 & 13-VII-70, 21-VIII-71, 23-VII-74, 10-V-76, 13-VII-77(destroyed by vandals), 12-V-82, ex larvae eclosed 12 & 23-VIII-84.
CALVERT: (1)
CARROLL: Reese, 5-VIII-67.

Symmerista albifrons (J.E.Sm.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 28-VI-71, 7-VII-72, 19 & 20-VI-73, 28-IV-74 & 26-IV-85. Loch Raven, 6-VII-70 & 28-VI-71.
CALVERT: (1)
FREDERICK: Catoctin Mt. Pk., 24-VI-83.

Hyparpax aurora (J.E.Sm.)

ANNE ARUNDEL: (1)
CALVERT: (1)

Ellida caniplaga (Wlk.)

FREDERICK: Catoctin Mt. Pk., 24-VI-83.

Dasylophia anguina (J.E.Sm.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 6-VII-65, 22,25,27 & 28-VII-70, 2 & 12-VIII-72, 12 & 15-VIII-73, 25-VIII-75 & 1-VIII-76.

Dasylophia thyatiroides (Wlk.)

ANNE ARUNDEL: (1)
CALVERT: (1)

Heterocampa obliqua Pack.

ANNE ARUNDEL: (1)
CARROLL: Reese, 28-VII-72.

Heterocampa umbrata Wlk.

ANNE ARUNDEL: (1)
BALTIMORE: Loch Raven, 11-VI & 23-VII-70.
CALVERT: (1)
CARROLL: Camp Hashawa, 7-VI-81 collected by P.J.Kean.

form "nigra" F.H.Cher.

ANNE ARUNDEL: Rolling Rd., 20-VI-77 collected by P.J.Kean.
BALTIMORE: Baltimore, Gwynn Oak, 25-V-66 collected by F.H.Chermock.

Heterocampa biundata Wlk.

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 25-VI-65 & 28-V-66 collected by F.H. Chermock. Ten Hills, 26-VII-70.
CALVERT: (1)

Heterocampa guttivitta (Wlk.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 25 & 28-V-66 collected by F.H. Chermock. Ten Hills, 21-VI-66, 17-VII & 4-VIII-70, 26-V & 8-VI-71, 2 & 11-VIII-72, 25-VII & 1-VIII-73, 10-VIII-79, 5-VIII-80 & 23-VII-84.
CALVERT: (1)
GARRETT: Carey Run, 9-VII-82 collected by P.J.Kean.
ST. MARYS: Lexington Pk., 27-VI-74 collected by W.A.Andersen.
WORCESTER: Shad Landing St. Pk., 28-VI-83 collected by J.D.Glaser.

Lochmaeus manteo Dbl.

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, VIII-59, 25-VIII-71, 10-VII & 1-VIII-73 & 17-VIII-84. Loch Raven, 17-VI-70.

Lochmaeus bilineata (Pack.)

ANNE ARUNDEL: (1)

BALTIMORE: Baltimore, Gwynn Oak, 1 & 25-VI-65 & 28-V-66 collected by F.H.Chermock. Ten Hills, 4-VIII-64, 25-VII-65, 3 & 31-VII & 3,6 & 7-VIII-66, 7 & 12-VII-68, 31-V & 3,4,6 & 24-VI & 11-VII & 7-VIII-69, 1-VI & 26 & 27-VII & 6-VIII-70, 21-VI-71, 25-VI-80, 26-VII & 1-VIII-83 & 24-VI & 7-VII-85. Loch Raven, 4-VIII-69 & 21-VI-71.
CALVERT: (1)

Misogada unicolor (Pack.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 20 & 27-VI-65 collected by F.H. Chermock. Ten Hills, 19-VIII-72. Loch Raven, 11 & 22-VI-70 & 21-VI-71.
CALVERT: (1)

Macrurocampa marthesia (Cram.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 25-VI-65 collected by F.H.Chermock. Ten Hills, 12-VIII-64 & 20-VI-69. Loch Raven, 11-VI & 27-VII-70 & 8-VII-71.
CALVERT: (1)
CARROLL: Reese, 28-VII-72.
ST. MARYS: Lexington Pk., 26-VI-76.

Oligocentria lignicolor (Wlk.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 18-VIII-81, Loch Raven, 6 & 30-VII-70 & 28-VI-71. Stevenson, 12-VI-60 collected by F.H.Chermock.
CALVERT: (1)
CARROLL: Camp Hashawa, 7-VI-81 collected by P.J.Kean. Reese, 28-VII-72.
ST. MARYS: Lexington Pk., 26-VI-76.

Oligocentria semirufescens (Wlk.)

ANNE ARUNDEL: (1)
BALTIMORE: Loch Raven, 11-VI & 23-VII-70.

Schizura ipomoeae Dbl.

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 8 & 14-VIII-66, 23-VIII-67, 3-VII-69, 9-VIII-70, 26-VI-71, 21-VI & 31-VII & 4,12 & 17-VIII-73, 25-VIII-75 & 26-V & 15-VII-77. Loch Raven, 5 & 11-VI & 6 & 27-VII-70.
CALVERT: (1)
CARROLL: Reese, 28-VII-72.

forms "cinereofrons" (Pack.) and "telifer" (Grt.) were common at all stations.

Schizura concinna (J.E.Sm.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 1-VII-65 collected by F.H.Chermock.

Schizura badia (Pack.)

ANNE ARUNDEL: (1)
BALTIMORE: Hebbville, 1-VIII-59 collected by F.H.Chermock.
CALVERT: (1)

Schizura unicornis (J.E.Sm.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 2-VIII-73, 19-VIII-81, 29-VII-82, 27-VI-84 & 5-VI & 6-VII-85. Catonsville-UMBC, 18-VII-77. Loch Raven, 5-VI-70.
CALVERT: (1)
CARROLL: Finksburg, 22-VIII-73. Reese, 28-VII-72.
HOWARD: Evergreen Valley, 28-VIII-73.

Schizura apicalis (Grt.& Rob.)

BALTIMORE: Baltimore, Ten Hills, 11-VII-69 & 31-VII-73.

Schizura leptinoides (Grt.)

ALLEGANY: Rocky Gap St. Pk., 21-VII-82 collected by J.D.Glaser.
ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 9-VIII-71, 4-VIII-80 & 7-VIII-83. Loch Raven, 17 & 22-VI-70.
CALVERT: (1)

Furcula borealis (Guer.-M.)

ANNE ARUNDEL: (1)
CALVERT: (1)

Furcula cinerea (Wlk.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 1 & 26-VI-65 collected by F.H. Chermock. Ten Hills, 21-VI-66, 25-VI-80 & 27-VI-83. Loch Raven, 7-VIII-69 & 30-VII-70.

Gluphisia septentrionis Wlk.

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 26-VII-70. Stevenson, 27-VI & 16-VII-59 collected by F.H.Chermock.
CALVERT: (1)

LYMANTRIIDAE
ORGYIINAE

Orgyia leucostigma (J.E.Sm.)

ANNE ARUNDEL: Sherwood Forest, 1-VIII-73.
BALTIMORE: Baltimore, Ten Hills, 22-VII-72, 9,10,12 & 17-VII & 20-IX-73, 22-VII-74, 3 & 5-VII & 17-IX-80, 30-IX & 20-XI-82, 16,18 & 25-VII-83, 19-VII & 21-VIII & 20-X-84 & 16-VII-85.
CALVERT: (1)
CHARLES: Waldorf, 9-X-71.

Orgyia definita Pack.

ANNE ARUNDEL: (1)
CALVERT: (1)

Dasychira basiflava (Pack.)

ANNE ARUNDEL: (1)
CARROLL: Reese, 28-VII-72.
WASHINGTON: Ft. Frederick, 30-VII-66 collected by W.A.Andersen.

Dasychira tephra Hbn.

ANNE ARUNDEL: (1)

Dasychira atrivenosa (Palm.)

ANNE ARUNDEL: (1)
CALVERT: (1)

Dasychira obliquata (Grt.& Rob.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 7-VIII-70 & 2-VIII-73. Loch Raven, 2 & 23-VII-70.
CALVERT: (1)

Dasychira manto (Stkr.)

ANNE ARUNDEL: (1)
CALVERT: (1)

Lymantria dispar (L.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 11 & 13-VII-73, 29-VI & 1 & 4-VII-76, 9 & 18-VII-81, 3 & 14-VII-82, 15 & 20-VII-83, 24-VII-84, 22-VI-91 & 27-VI & 3-VIII-92 & 1-VIII-93.
CALVERT: (1)
[In addition to the 3 counties listed above, this moth has been captured in all 20 remaining Maryland counties by MDA.] (2)

LASIOCAMPIDAE
MACROMPHALIINAE

Artace cribraria (Ljungh)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 16-VII-82, 21-X-84 & 30-IX-90. Loch Raven, 28-VI-71.
CALVERT: (1)

Tolype velleda (Stoll)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 10 & 12-X-66 collected by F.H. Chermock. Ten Hills, 30-IX-71, 13-X-73, 4-X-81, 5-X-82 & 12-X-84.
CALVERT: (1)

Tolype laricis (Fitch)

ANNE ARUNDEL: (1)
CALVERT: (1)

Tolype notialis Franc.

ANNE ARUNDEL: (1)
BALTIMORE: Loch Raven, 23-VII-70.
CALVERT: (1)
CARROLL: Marriottsville, 24-VI-69.

LASIOCAMPINAE

Malacosoma americanum (F.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 28-VI-65 collected by F.H.Chermock. Ten Hills, VI-61, 6-VI-65, 21-VI & 3-VII-66, 10-VI-69, 15-VI-72 & 28-V-85. Loch Raven, 28-VI-71.
CALVERT: (1)

Malacosoma disstria Hbn.

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 23 & 24-VI-69, 18 & 30-VI & 5-VII-70, 25-VI & 15-VII-71, 26-VI-72, 8,12 & 15-VI-81. Loch Raven, 17-VI-70 & 21-VI-71.
CALVERT: (1)
WASHINGTON: Sideling Hill, 8-VII-67.

GASTROPACHINAE

Phyllodesma americana (Harr.)

ANNE ARUNDEL: (1)
CALVERT: Calvert Beach, 30-III-64 collected by F.H.Chermock.

BOMBYCIDAE

Bombyx mori (L.)

BALTIMORE: Baltimore, Ten Hills, 3-VII-63, 7,10 & 22-VI-66 & 16-VII & 1-VIII-67.

APATELODIDAE

Apatelodes torrefacta (J.E.Sm.)

ALLEGANY: Belle Grove, 12-VII-79 collected by W.A.Andersen.
ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Ten Hills, 30-VI-69 & 5-VII-70. Loch Raven, 20-VII-70, 28-VI & 12-VII-71.
CALVERT: (1)
HARFORD: Edgewood Arsenal, 1-VII-76 collected by W.A.Andersen.

Olceclostera angelica (Grt.)

ANNE ARUNDEL: (1)
BALTIMORE: Baltimore, Gwynn Oak, 27 & 28-VI-65 collected by F.H. Chermock. Ten Hills, 1-VII-72.
CALVERT: (1)

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COLLECTING IN THE GEORGE WASHINGTON NATIONAL FOREST

Edgar and Joy Cohen

Nineteen-ninety was a banner year for the Diana fritillary, Speyeria diana (Cramer), in the George Washington National Forest, Bath Co., Va. On the first of our two trips that year (June 22-24), the weather was pleasant and some males were seen, but they were not in the numbers we had expected. Apparently, we had arrived ahead of the emergence peak for these fritillaries. Since the milkweeds were not yet in flower, we posited that the flight period was delayed by the cool and rainy weather of the preceding two months. However, with respect to the Diana females, we knew that they often emerge two to three weeks later than the males. Therefore, we were concerned that the females would not be on the wing. Since our goal was to observe the beautiful black and iridescent blue females, we decided to leave and return in a few weeks.

Our second trip to the area was on the weekend of July 13-15, under wet conditions. Most collectors would have been discouraged under such circumstances. However, Speyeria diana is a woodland species, which can be collected in such adverse conditions. Upon arriving late in the afternoon on Friday (the thirteenth! -an ill omen for the superstitious), we learned that there had been a bad storm the previous evening. We postponed our collecting until Saturday, but with little improvement in the weather. Although the forecast called for a

100 percent chance of rain, two brief periods of sunshine did occur. Despite the rain, we found both male and female Diana fritillaries present in good numbers. We noted that the males were still in excellent condition, confirming our assumption that they had emerged later than usual that season.

Sunday, July 15, was a better day weatherwise, but still a marginal one for collecting. Joy decided to photograph several male and female Dianas perched on milkweed, which now were in flower. Later, I was fortunate to observe a mating pair of Dianas perched on a black locust tree. Joy took several photos of them before the beautiful blue female carried her mate into the woods.

We decided to extend our visit until Monday, because ideal weather was predicted for that day. On Monday, we still found males, but not one female was encountered. Perhaps, overcast days are necessary for observing Diana females in sizeable numbers! In addition to the Diana, we observed another interesting butterfly on Monday: Polygonia progne (Cramer), the gray comma. Although this anglewing is a well-known resident of the area, it usually appears on the wing during the latter part of June, rather than in mid-July. This observation also confirmed our previous assumption of the weather induced, delayed flight season. In closing, our sightings and observations suggest that the Diana populations in Bath Co. are strong and stable. This region always is a rewarding one to visit.

E. & J.C., 5454 Marsh Hawk Way, Columbia, Md. 21045

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ADDITIONS TO THE CATOCALA MOTHS OF MARYLAND AND A LIST OF THE REMAINING CATOCALINAE

Robert S. Bryant

When the inaugural segment of the check list of the moths of Maryland was published, nearly 17 years ago, I envisioned a need to update it from time to time so that new species and counties could be added. In fact, I naively thought that my little article would open the flood gates, so to speak, and additional records would come pouring in from all quarters making periodic updates, not only desirable but, necessary. After a brief period of such activity in the early 1980's very little has been submitted since and there is no point in waiting any longer. Additions to the original list are presented here in the hope that it might stimulate another period of interest among local collectors.

Since I did not touch on this subject in the first paper (Bryant, 1979a), it might be worth mentioning that there is a fairly high incidence of melanism among the Catocalas and it seems to be on the increase. Holland (1903) did not figure any melanics, Barnes and McDunnough (1918) only figured four, McDunnough (1938) listed six and Sargent (1976) figured 14. It has been my experience that melanics turn up most frequently among those species that maintain fairly high annual populations such as C. ilia (Cram.) and C. ultronia (Hbn.) and especially during years when one species or another enjoys a population explosion. Such was the case between 1958 and 1961 when C. paleogama Gn. was so common around Baltimore. During that period I collected three of the melanic form "denussa" Ehr. and three bizarre somatic mosaics showing patches of melanism. Sargent briefly summarizes the known (or supposed) reasons for melanism and designates two causes; (a) environmental darkening of a substrate through sooty carbon deposits which render dark moths at a selective advantage, from predators, over their lighter counterparts and (b) environmental pollution, also through sooty carbon deposits (or acid rain) on leaves which are then ingested by larvae, possibly affecting pigmentation in the adult stage. I would add a third category, (c) environmental contamination of the soil or ground water through deliberate or accidental spills or disasters. Chemical contaminants can easily be absorbed by plants and thus possibly affect the larvae that feed on them. Such would seem to have been the case in the Stevenson area of Baltimore Co. Sometime prior to 1952, so the story goes, a truck carrying radio active material overturned on one of the bridges that crosses the Jones Falls in Green Spring Valley (F.H.Chermock, pers. comm.). The radio active material not only affected the plant life growing in the stream bed and along the edges, but it also produced large numbers of melanics in many

species of lepidoptera found in the area. On one of many visits to the Chermock home, I was given six mounted specimens of C. ilia form "satanas" Reiff and C. ultronia form "nigrescens" Cass., along with this incredible story, and led to believe that a great deal more melanic material had been papered, for trading purposes, and stored in gallon jars in the cellar. I do not know if this story was true, or apocryphal, or somewhere in between but when I was introduced to the Stevenson area, in the early 1960's, there were still some melanic Clossiana bellona toddi (Holl.) and an occasional Lycaena phlaeas americana Harr. with coalesced spots, in evidence near the stream.

Among the other catocaline genera only Allotria and Euparthenos, each with a single species, show much of a penchant toward melanism. In some years the A. elonympha (Hbn.) in my study area may run as high as 20 percent toward melanics. By contrast, however, even partial melanics of E. nubilis (Hbn.) are few and far between. I will never forget the night in 1965 when I collected my most highly prized specimen. Upon returning from a late session at the Chermock home I noticed a very dark nubilis sitting on the back wall of my house, below the flood light. It wasn't until the specimen was safely in a cyanide jar that the dramatic and unmistakable hind wing pattern of E. nubilis form "unilineata" Cher.& Cher. became visible. Ironically, I had caught a very rare moth that had been described 25 years before by the man I had just been visiting! On a subsequent return visit he confirmed my identification and placed the coveted yellow Metatype label on the specimen.

The following list is divided in two parts, this time. Part one contains just the catocaline moths in the genus Catocala. The ten new species and numerous new county records are marked with an asterisk for easy identification. I have also added some supplemental records (from papered and frozen material and other sources) to some of the species that were previously reported in order to extend the flight periods or to augment other insufficient information. Entries followed by the number one, in parentheses, were reported in a past issue of Phaeton. Entries followed by the number two, in parentheses, were reported in the last issue of this journal. Part two contains the remaining genera of the Catocalinae that were not included last time. In both parts, the counties are arranged alphabetically and in a column to facilitate fast reference. The initials following the dates, in most cases, indicate the collector and/or the present location of the specimen. For explanation of the initials consult the acknowledgements section. The listing follows the arrangement in the McDunnough check list, as was done in 1979, although the nomenclature has been updated to reflect that used by Covell, Hodges and other contemporary authors. I would appreciate being apprised of any new species or new county records that might turn up so that this list may be updated on a more regular basis.

NOCTUIDAE
CATOCALINAE

Part 1

Catocala piatrix Grt.

*ANNE ARUNDEL: Fairhaven, 2 & 18-IX-88(RTM).
BALTIMORE: Baltimore, Ten Hills, 23-IX-71, 8,9,10,15,16 & 20-IX-72, 11-IX-73, 29-VII & 20 & 26-VIII-83(RSB). Sparks, 1-VI-65 collected by D.L.Staines.
*GARRETT: Swallow Falls St. For., 1-VIII-58(RTM).
*PRINCE GEORGES: University Pk., 19-VIII-73(RTM).

Catocala epione (Dru.)

ANNE ARUNDEL: Annapolis, 26-VI-78 & 12-VII-79(WTH).

Catocala muliercula Gn.

WORCESTER: Isle of Wight, 31-VII & 7 & 8-VIII-79(RSB) collected by W.A.Andersen.

*Catocala habilis Grt.

GARRETT: Swallow Falls St. For., 1-VIII-58(RTM).

*Catocala judith Stkr.

ANNE ARUNDEL: Annapolis, 18-VII-79(WTH).

Catocala flebilis Grt.

ANNE ARUNDEL: Annapolis, 7-VII-78 & 18-VII-79(WTH).
*HARFORD: Belair, 17-VIII-82(RSB) collected by W.A.Andersen.

*Catocala obscura Stkr.

GARRETT: Bittinger, 30-VIII-66(RTM).

Catocala residua Grt.

BALTIMORE: Baltimore, Ten Hills, 8-VIII-91(RSB).
*GARRETT: Bittinger, 30-VIII-66(RTM).

Catocala retecta Grt.

*GARRETT: Bittinger, 2-IX-59, 28,29 & 30-VIII-66 & 23-VIII-71(RTM).

form "luctuosa" Hulst

*ANNE ARUNDEL: Annapolis, 7-VII-78(WTH).
BALTIMORE: Baltimore, Ten Hills, 21-VIII-77(RSB).

Catocala vidua (J.E.Sm.)

BALTIMORE: Baltimore, Ten Hills, 5-VIII-80 & 14-IX-81(RSB).
*PRINCE GEORGES: College Park, 23-VII-70 collected by C.L.Staines,Jr.

Catocala lacrymosa Gn.

form "paulina" Hy. Edw.

ANNE ARUNDEL: Annapolis, 7-VII-78(WTH).

Catocala paleogama Gn.

ANNE ARUNDEL: Annapolis, 18,26 & 28-VII-79(WTH).
BALTIMORE: Baltimore, Ten Hills, 2,6,9 & 11-VIII-80 & 19-VII & 5-VIII-81 & ex larva eclosed 21-VI-94 at ambient temps.(RSB).
*GARRETT: Keyser's Ridge, 29-VIII-82 collected by P.J.Kean. (1) Swallow Falls St. Pk., 25-VIII-87(RSB) collected by P.J.Kean.

form "phalanga" Grt.

ANNE ARUNDEL: Annapolis, 26-VII-79(WTH).

form "denussa" Ehr.

BALTIMORE: Baltimore, Ten Hills, VIII-59 & VIII-61(RSB).

*Catocala nebulosa Edw.

ANNE ARUNDEL: Annapolis, 18-VIII-79(WTH).

Catocala subnata Grt.

*GARRETT: Bittinger, 25-VIII-65(RTM).

Catocala neogama (J.E.Sm.)

ANNE ARUNDEL: Annapolis, 7-VII-78(WTH).
BALTIMORE: Baltimore, Ten Hills, 31-VII & 3 & 11-VIII-80, 26-VIII-83, 13-IX-84 & 14-VII-85(RSB).

Catocala ilia (Cram.)

*ALLEGANY: Green Ridge St. For., 2-VII-77(RSB).
ANNE ARUNDEL: Annapolis, 7-VII-78 & 26-VII-79(WTH). Fairhaven, 2 & 19-IX-88(RTM).
BALTIMORE: Baltimore, Ten Hills, 23-VI-77, 17-VIII-84, 30-VI & 4-VII-85(RSB).
*GARRETT: Grantsville, 12-VII-85 collected by E.Cohen. (1)
*PRINCE GEORGES: Bowie-PWRC, 28-VI-45(RTM). College Pk., 31-VII-76 collected by A.M.Wilson. University Pk., ex larva eclosed 16-VI-77(RTM).
*WASHINGTON: Woodmont, 2-VII-77(RSB).
*WORCESTER: Isle of Wight, 8-VIII-79(RSB) collected by W.A.Andersen.

form "conspicua" Worthington

ANNE ARUNDEL: Annapolis, 7-VII-78 & 18-VIII-79(WTH). Severn, 28-VI-74(RSB) collected by F.Overstreet.
PRINCE GEORGES: Bowie-PWRC, 28-VI-45(RTM).

form "satanas" Reiff

ANNE ARUNDEL: Annapolis, 17-VII-79(WTH).
PRINCE GEORGES: Riverdale, 29-VII-61(RTM).

Catocala relicta Wlk.

*GARRETT: Bittinger, 23-VIII-65(RTM).

*Catocala marmorata Edw.

CALVERT: (2)

Catocala cara Gn.

*GARRETT: Keyser's Ridge, 29-VIII-82 collected by P.J.Kean. (1)
*PRINCE GEORGES: Bowie-PWRC, 23-IX-46(RTM).

Catocala amatrix (Hbn.)

ANNE ARUNDEL: Annapolis, 3-VII-77(WTH).
*PRINCE GEORGES: College Pk., 6-X-75(CLS) collected by M.Lawton.
University Pk., 11-VIII-64(RTM).

form "selecta" Wlk.

PRINCE GEORGES: Bowie-PWRC, 4-IX-43(RTM).

*Catocala illecta Wlk.

ANNE ARUNDEL: Annapolis, 7-VII-78(WTH).

*Catocala sordida Grt.

GARRETT: Deep Creek Lake, late VII-80(RSB) collected by P.J.Kean.

*Catocala gracilis Edw.

ANNE ARUNDEL: (2)

Catocala andromedae (Gn.)

ANNE ARUNDEL: Annapolis, 11-VII-79(WTH).

Catocala coccinata Grt.

*ANNE ARUNDEL: Annapolis, 28-VII-79(WTH).

Catocala ultronia (Hbn.)

ANNE ARUNDEL: Annapolis, 11 & 16-VII-79(WTH).
BALTIMORE: Baltimore, Ten Hills, 4-VII-81(RSB).
*CARROLL: Reese, 19-VIII-67(RSB).
*PRINCE GEORGES: Riverdale, 21,29 & 31-VII-61(RTM). University Pk.,
30-VII-74 & 16-VI-77(RTM).

*Catocala crataegi Saunders

ANNE ARUNDEL: Edgewater, 2-VII-80(CLS).

Catocala grynea (Cram.)

*ANNE ARUNDEL: Annapolis, 18-VII-79(WTH).
BALTIMORE: Baltimore, Ten Hills, 23-VI & 2-VII-77, 27-VI & 5-VII-80,
16-VII-81 & 15-VII-82(RSB).
*PRINCE GEORGES: Riverdale, 2-VIII-61(RTM).

Catocala blandula Hulst

*BALTIMORE: Baltimore, Ten Hills, 5-VII-80(RSB).

*Catocala minuta Edw.

GARRETT: Deep Creek Lake, late VII-80(RSB) collected by P.J.Kean.

Catocala micronympha Gn.

*ANNE ARUNDEL: Annapolis, 11 & 18-VII-79(WTH).
*GARRETT: Deep Creek Lake, late VII-80(RSB) collected by P.J.Kean.

form "gisela" Meyer

GARRETT: Deep Creek Lake, late VII-80(RSB) collected by P.J.Kean.

Catocala connubialis Gn.

ANNE ARUNDEL: Annapolis, 2 & 11-VII-79(WTH).

form "cordelia" Edw.

*PRINCE GEORGES: Riverdale, 2-VIII-61(RTM).

Catocala amica (Hbn.)

ANNE ARUNDEL: Annapolis, 26-VI-78 & 25-VII-79(WTH).
BALTIMORE: Baltimore, Ten Hills, 8 & 11-VII & 5 & 12-VIII-80(RSB).
*PRINCE GEORGES: Riverdale, 29-VII-61(RTM).

form "curvifascia" Brower

*PRINCE GEORGES: Riverdale, 29-VIII-61(RTM).

Part 2

Euparthenos nubilis (Hbn.)

ALLEGANY: LaVale, 4-VIII-83(RSB) collected by J.D.Glaser.
ANNE ARUNDEL: Annapolis, 12,17 & 24-V-79(WTH). Edgewater, 20-VI-80 collected by C.L.Staines, Jr.
BALTIMORE: Baltimore, 3-VII-55(RSB) collected by F.H.Chermock. Ten Hills, 6,7,17,18 & 20-VIII-65, 1-VIII-69, 21-V & 2-VI & 15-VII & 22-VIII-71, 9-VI & 15-VIII-72, 19-IV-76, 16-VIII-81, 8 & 17-VIII-84, 1-V & 15-VI-85 & 13-VIII-91(RSB). Parkton, 18-V-88(FWH).
CALVERT: (2)

form "unilineata" Cher. & Cher.

BALTIMORE: Baltimore, Ten Hills, 8-VIII-65(RSB).

Allotria elonympha (Hbn.)

ALLEGANY: Rocky Gap St. Pk., 10-VI-83(RSB) collected by J.D.Glaser.
ANNE ARUNDEL: Annapolis, 26-VI & 17-VIII-78(WTH).
BALTIMORE: Baltimore, Ten Hills, 25-VII & 9-VIII-65, 11-VII-66, 2,9 & 12-VIII-70, 24-VI & 19-VII-71, 26-VII-72, 31-VII & 29-VIII-73, 4-VI-77, 5-VIII-79, 15 & 28-VII-80, 5 & 22-VI-81, 3-VII & 4 & 16-VIII-82, 19 & 31-VII & 4-VIII-84, 6,19 & 28-VII-85 27-VII-91(RSB). Gwynn Oak, 28-VI-65(RSB).
CALVERT: (2)
CARROLL: Camp Hashawa, 7-VI-81(RSB) collected by P.J.Kean.
WASHINGTON: Sideling Hill, 22-VII-84(RSB) collected by P.J.Kean.

Parallelia bistriaris Hbn.

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 23-VIII-67, 31-V & 4-VI & 21-VII & 7 & 9-VIII-70, 5-VIII-71, 19-VIII-72, 22-VI-73, 15-VII-77 & 22-V-85(RSB).
CALVERT: (2)

Euclidia cuspidea (Hbn.)

ALLEGANY: Green Ridge St. For., 16-VII-70 & 25-V-78(RSB) collected by W.A.Andersen. Rocky Gap St.Pk., 2-VI-83(RSB) collected by J.D.Glaser.
ANNE ARUNDEL: (2)
CALVERT: (2)
KENT: Golts, 26-V-84(RSB) collected by W.A.Andersen.

Caenurgina crassiuscula (Haw.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, VI-60, 8-V & 21-VI-64, 8-IX-65, 20-V & 24-VIII-66, 9-VIII-70, 5-X-72, 16-VIII & 9-IX-73, 7-III & 30-IV-74, 31-III & 11-IV-81, 16-IV & 12-VIII-82, 10-X-84 & 6-V-85(RSB). Hebbville, 27-IX-63(RSB).
CALVERT: (2)
CARROLL: Reese, 17-IV-68(RSB).
HOWARD: Woodbine, 30-IV-65 & 8-V-70(RSB).
MONTGOMERY: Seneca, 10-IV-80(RSB) collected by W.A.Andersen.

Caenurgina erechtea (Cram.)

ANNE ARUNDEL: (2)

BALTIMORE: Baltimore, Ten Hills, IX-61, 25-VI-65, 2-IV-67, 6-VII-70, 13-IV & 24-VI & 5-VIII-71, 7 & 8-VII-72, 12-VII-74, 17-IV-77, 25 & 28-VII & 25-IX-81, 5-VII & 23-VIII & 1,11 & 14-IX & 21-X-84(RSB).
CALVERT: (2)
HOWARD: Woodbine, 26-IX-63(RSB).

Mocis texana (Morr.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 19-VIII & 4 & 6-IX-68, 9-IX-69, 23-VII-70, 11-V & 29-VII-71, 14-VIII-73, 17 & 18-IX-80 & 14-VIII-84 (RSB). Catonsville-UMBC, 10-VI-71(RSB).
CALVERT: (2)
CARROLL: Reese, 24-VI-67(RSB).

Mocis latipes (Gn.)

ANNE ARUNDEL: (2)

Celiptera frustulum Gn.

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, VIII-63, 17-VIII-71, 17-IX-72, 20-VI-79 & 13-V-82(RSB).
CALVERT: (2)

Argyrostrotis anilis (Dru.)

CALVERT: (2)

Doryodes bistrialis (Gey.)

CALVERT: (2)

Zale lunata (Dru.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, X-57, 23-IX & 3-X-60, 15 & 19-X-65, 4-XI-67, 12-X & 2 & 3-XI-69, 20-VI & 1 & 10-VIII & 5 & 30-IX & 9 & 20-X-70, 9 & 18-VIII-71, 1-V & 1 & 11-VII & 10-VIII & 10,12 & 17-IX-72 & 12-XI-82(RSB). Hebbville, 27-IX-63(RSB).
CALVERT: (2)
CARROLL: Reese, 10-XI-67 & 21-IX-68(RSB).

Zale unilineata (Grt.)

ALLEGANY: Flintstone, 7-V-60(RSB) collected by F.H.Chermock.
ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 4-V-65 & 16-IV-73(RSB).
CALVERT: (2)

Zale galbanata (Morr.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 3 & 7-VIII-66, 1-VIII-69, 21-V & 12,25,27 & 28-VII & 18-IX-70, 4-VI-71, 6-V & 23-VII & 2-VIII-72, 16-IV & 6 & 9-V & 24-VII & 13-IX-73, 12-VII & 29-IX-74, 14 & 17-VII-76, 28-V-77, 16 & 25-V-80, 23-V & 6,12 & 24-VII & 10-VIII-81, 10-V & 14-VI & 13,14 & 23-VII-82, 13-V-83 & 27-V-85(RSB). Catonsville-UMBC, 10-VI-71(RSB).

Zale aeruginosa (Gn.)

ANNE ARUNDEL: (2)

Zale undularis (Dru.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, VIII-63, 7 & 8-VII-64, 20-V & 5-VI-66, 16-VI & 17 & 21-VII & 2 & 11-VIII-70, 21-IV-71, 16-V-85(RSB).
CALVERT: (2)

form "umbripennis" Grt.

BALTIMORE: Baltimore, Ten Hills, 1-VI-66, 4-VI-72, 5-VI-77, 24-V-82, 12-VII-86(RSB).

Zale minerea (Gn.)

ALLEGANY: Flintstone, 7-V-60(RSB) collected by F.H.Chermock.

ANNE ARUNDEL: (2)
BALTIMORE: Gwynn Oak, 25-V-66(RSB) collected by F.H.Chermock.
CALVERT: (2)
CARROLL: Reese, 27-IV-68 & 28-VII-72(RSB).

Zale duplicata (Bethune)

ALLEGANY: Flintstone, 7-V-60(RSB) collected by F.H.Chermock.

Zale helata (Sm.)

ALLEGANY: Flintstone, 7-V-60(RSB) collected by F.H.Chermock.
ANNE ARUNDEL: (2)

Zale bethunei (Sm.)

ALLEGANY: Flintstone: 7-V-60(RSB) collected by F.H.Chermock.
ANNE ARUNDEL: (2)
CALVERT: (2)

Zale metata (Sm.)

ANNE ARUNDEL: (2)
CALVERT: (2)

Zale metatoides McD.

ALLEGANY: Flintstone, 7-V-60(RSB) collected by F.H.Chermock.
ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 13-VI-71(RSB).

Zale lunifera (Hbn.)

ALLEGANY: Flintstone, 7-V-60(RSB) collected by F.H.Chermock.

Zale submediana Strand

ANNE ARUNDEL: (2)
KENT: Horsehead Sanctuary, 9-V-87 collected by H.Godwin. (1)

Zale horrida Hbn.

ANNE ARUNDEL: Sherwood Forest, 27-VII-64(RSB).
BALTIMORE: Baltimore, Ten Hills, 14-VII-66, 5-VI-69, 25-VII-70, 20 & 21-VIII-71, 2-X-72, 1-V-77, 1-VIII-81, 8-VII & 14-VIII-84, 1 & 7-V-85(RSB).
CALVERT: (2)
WORCESTER: Isle of Wight, 31-VII-79(RSB) collected by W.A.Andersen.

Ascalapha odorata (L.)

BALTIMORE: Baltimore, Ten Hills, 26-VIII-68(RSB).
CALVERT: Plum Point, 30-VIII-67(JHF).

Thysania zenobia (Cram.)

CALVERT: Plum Point, 15-IX-74(JHF).
ST. MARYS: Lexington Pk., IX-74 collected by J.Haliscak.

Lesmone detrahens (Wlk.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 3-VI & 14-VII-70 & 8-VI-81(RSB).
CALVERT: (2)
CARROLL: Reese, 7-VI-69(RSB).

Panopoda rufimargo (Hbn.)

ANNE ARUNDEL: Sherwood Forest, 21-VII-64(RSB).
BALTIMORE: Baltimore, Ten Hills, VII-60, VIII-63, 13-VI-64, 9-VII-73, 3-VII & 4-VIII-80, 7-VII-81, 14,15 & 17-VII-82(RSB). Loch Raven, 28-VI-71(RSB).
CALVERT: (2)
CARROLL: Reese, 28-VII-72(RSB).
FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).

Panopoda carneicosta Gn.

ANNE ARUNDEL: (2)

BALTIMORE: Baltimore, Ten Hills, 7-VIII-65, 8-VI-70, 17 & 18-VII & 20-VIII-71, 12-VII-81 & 31-VIII-89(RSB).
CARROLL: Reese, 28-VII-72(RSB).

Phoberia atomaris Hbn.

ALLEGANY: Green Ridge St. For., 7-V-70(RSB), 15-IV-82(RSB) collected by J.H.Fales.
ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 26-IV-65, 20-V-66, 2-IV-67, 1 & 12-IV-71, 26-III-73, 31-III-79, 29-III & 2-IV-81(RSB). Gwynn Oak, 22-III-66(RSB) collected by F.H.Chermock.
CALVERT: (2)
GARRETT: Friendsville, 20-V-71(RSB) collected by W.A.Andersen.

Anticarsia gemmatalis Hbn.

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 2-X-70, 30-IX & 1,6 & 7-X-72, 18 & 20-IX-73(RSB).
CALVERT: Cove Point, 9-X-69(RSB) collected by W.A.Andersen.

Spiloloma lunilinea Grt.

BALTIMORE: Baltimore, Ten Hills, 6-VII-65, 4 & 25-VII-71(RSB). Catonsville-UMBC, 17-VI-70(RSB).
CALVERT: (2)

Calyptra canadensis (Beth.)

CALVERT: (2)

Hypsoropha hormos Hbn.

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, VII-63, 8-VIII-66, 7-VII-68, 30-VI-69, 10,24 & 26-VI & 3 & 5-VII-71, 3 & 22-VI-73, 15-VI-76, 17-VI-81, 24-VI & 24-VII-82, 11 & 15-VI & 11-VII-83 & 13,21 & 26-V-85(RSB).

Plusiodonta compressipalpis Gn.

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 2-VIII-66 & 19-V-70(RSB).
CALVERT: (2)

Scoliopteryx libatrix (L.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 26-VII-66, 19-VII & 1-VIII-70, 4-VIII-72 & 25-VII-81(RSB).
WORCESTER: Ocean City, 29-VIII-73(RSB) collected by W.A.Andersen.

Anomis erosa Hbn.

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 26,27 & 28-VIII-70, 15-IX-71, 7,10 & 29-VIII-72, 16 & 29-VIII & 10 & 14-IX-73, 2-VII-83, 22-IV-85(RSB).

Anomis commoda (Butler)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 16-IX & 10-XI-70, 13-IX-71, 6-VIII & 6,19 & 23-IX-72, 3-VI-73, 18-IV-76, 13-VIII-82, 24-VII & 8-X-84 & 12-VII-85(RSB).

Scolecocampa liburna (Gey.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 13-VI-64, 6-VIII-66, 12-VII-69, 25-VI & 12,16 & 23-VII-70, 18-VII-71(RSB). Loch Raven, 23-VII-70(RSB).
CALVERT: (2)

Phyprosopus callitrichoides Grt.

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 18-VIII-66, 30-VI-69, 21-VIII-70 & 31-V-71(RSB).
CALVERT: (2)

Isogona tenuis (Grt.)

ANNE ARUNDEL: (2)
CALVERT: (2)

Pangrapta decoralis Hbn.

ALLEGANY: Green Ridge St. For., 4-V-74(RSB).
ANNE ARUNDEL: (2)
FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).

Metalectra discalis (Grt.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 27-VIII-65 & 26-VI-85(RSB).
CALVERT: (2)

Metalectra quadrisignata (Wlk.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 20-VIII-66, 20-VIII-70, 5 & 27-VII & 20-VIII-71, 20 & 23-VII & 8,12 & 15-VIII-72, 26-VI-73, 7-VI & 17-VII & 5-IX-76, 14-VII & 21-VIII-82 & 21-V-85(RSB).

Metalectra richardsi Brower

ANNE ARUNDEL: (2)
CALVERT: (2)

Metalectra tantillus (GRT.)

BALTIMORE: Baltimore, Ten Hills, 21 & 23-VII & 6-VIII-72, 11-VI & 29-VII-76, 29-VII-80, 30-VI-81, 14-VI-82 & 29-VII-84(RSB).

Ledaea perditalis (Wlk.)

ANNE ARUNDEL: (2)
CALVERT: (2)

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A COLLECTING TRIP TO TIOGA COUNTY, PENNSYLVANIA

Edgar Cohen

Pennsylvania has much to offer Maryland collectors who wish to observe certain species of butterflies that are infrequently collected in our state. In years of major outbreaks of these species north of Maryland, the same butterflies often are more likely to be found in Maryland as well. Such was the case with Compton's tortoise shell, Nymphalis vau-album j-album (Boisduval & Leconte), which I encountered in large numbers during 1990 and 1991.

To observe the more northern butterflies during mid-June and early July, I twice visited a well-known collecting site in north central Pennsylvania (Gaines Township, Tioga Co.), located just west of Pennsylvania's Little Grand Canyon. I had hoped to find small numbers of Milbert's tortoise shell, Aglais milberti (Godart), which I had not seen in several years. I did not find it in June but, during my second visit (in July), I was elated to discover large numbers of a related butterfly, Compton's tortoise shell (N.v. j-album), along the gravel road adjacent to Lick Run. Although I had seen this species once or twice before, I've never witnessed such a profusion! Perhaps Compton's tortoise shell had somehow mysteriously replaced the smaller species.

The large numbers of Compton's tortoise shell were indicative of other nymphalid populations in 1990. That year was a good one for nymphalids in general, particularly for species of Speyeria. I found both S. cybele (Fabricius) and S. aphrodite (Fabricius) to be abundant in Maryland at that time. Furthermore, two MES members, Richard Smith and John Fales, collected Compton's tortoise shells in Maryland that same year. Richard Smith captured a specimen just west of Rocky Gap State Park, Allegany Co. on July 6, and John Fales found one feeding on dogwood berries on November 24 at Plum Point, in Calvert Co. The latter specimen represents a county record and it is the first record of this species occurring within the inner coastal plain of Maryland. Perhaps the large number of Pennsylvanian N. v. j-album is related to the occurrence of these rare Maryland specimens.

My story does not end in 1990. In the following year, I made another trip to Tioga Co.,PA, during the third week of June. I again encountered large numbers of N. v. j-album and at least a half dozen specimens of A. milberti. Lick Run appears to be a good locality for both tortoise shell species. It is also an area where Harris' checkerspot, Charidryas harrisii (Scudder) may be found, albeit in small numbers. In addition, the area is known for the sympatric populations of Basilarchia arthemis arthemis (Drury) and B. arthemis astyanax (Fabricius). In fact, intergrades [="proserpina" (W.H.Edwards)] between the two Basilarchia spp. are common here. Occasionally, one may find the narrow banded form of B. a. arthemis [="albofasciata" (Newcomb)].

I was first told about the Lick Run area by Dr. Austin Platt, who learned about it from the late George Patterson, who had collected there for many years. My reason for going there myself a number of years ago was to collect the Basilarchia butterflies. During my first Lick Run trip, I encountered the largest populations of these butterflies that I have ever seen.

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ADDITIONS TO THE SPHINX MOTHS OF MARYLAND

Robert S. Bryant

While the sphinx moths have not received as many additions to their list as the other groups being updated at this time, nevertheless several new species and county records are listed below and marked with an asterisk for easy recognition. As with the other groups I have also

added supplemental records (from frozen and papered material and other sources) to some of the species in order to extend flight period data, or to augment other insufficient information.

In his review of the genus Lapara, Riotte (1972) listed bombycoides Wlk. as occurring in Maryland without giving any specifics, so it was omitted from the first list. Hodges (1971) reports it as occurring along the mountains from South Carolina north to Nova Scotia. It was officially added to our fauna in 1982 when P. Kean, not surprisingly, collected a specimen in Garrett Co. However, Stevenson (1992a) reported a specimen from Anne Arundel Co., which seems too far east to be this species. I have not seen the specimen but it may be a small, more mottled (or badly rubbed, if trapped) specimen of L. coniferarum (J.E.Sm.).

Although several supposedly Maryland specimens of Pachysphinx modesta (Harr.) have been reported during the last 10 or 12 years, only one had reliable data, or indeed, any data at all. Diligent collecting in the Parkton area of Baltimore Co., by F. Holland, turned up a specimen in 1987.

By far, the most impressive and significant of the new sphingid records would have to be the discovery of Isoparce cupressi (Bdv.) in Calvert Co.(Stevenson,1992b). Although Hodges (1971) had given the range as Florida, north to South Carolina, and surmised that it might be found farther north along the coast, Covell (1984) still had it extending north only to South Carolina. So, these recent Calvert Co. records represent a quantum leap in the northward distribution of cupressi by several hundred miles.

It is surprising that several locally common species are, as yet, unrecorded. Such generally distributed species as Sphinx gordius Cram., S. drupiferarum J.E.Sm., Smerinthus cerisyi Kby. and even Hemaris gracilis (Grt.& Rob.) and Sphinx luscitiosa Clem. ought to be obtainable unless, in our headlong and ill advised dash to eliminate the gypsy moth from our forests we have, instead, eliminated numerous less hearty species along the way. Another possible reason for fewer sphinx records is that during the last half of the 1980's several dependable contributors to the Maryland Moth Survey began reporting their captures to someone else (now deceased). It is hoped that if anyone has species or county records not reported here, or in the first list (Bryant, 1981a), that they will notify the author.

In the list below, entries followed by the number one, in parentheses, were reported in a past issue of Phaeton. Entries followed by the number two, in parentheses, were reported in the last issue of this journal. The single entry followed by the number three, in parentheses, was reported in Life Science Contributions, Royal Ontario Museum. The initials following the dates, in most cases, indicate the collector and/or the present location of the specimen. For explanation of the initials consult the acknowledgements section. The listing follows the arrangement in the McDunnough check list although the nomenclature has been updated to reflect that currently in use by Covell, Hodges and other contemporary authors.

SPHINGIDAE
SPHINGINAE

Agrius cingulata (F.)

*ANNE ARUNDEL: Harwood, 7-VII-83(WTH).
CALVERT: (2)
*HOWARD: Columbia, VIII-90(APP) collected by F.E.Hanson.
*MONTGOMERY: Olney, 3-X-76 collected by C.Berbut.
*PRINCE GEORGES: Suitland, 24-X-83 collected by B.Haiden. (1)

Manduca sexta (L.)

ANNE ARUNDEL: Harwood, VII & VIII-84(WTH).
BALTIMORE: Sparks, 15-VIII-70 collected by C.L.Staines, Jr.
*WORCESTER: Ocean City, 29-VIII-73(RSB) collected by W.A.Andersen.

Manduca quinquemaculata (Haw.)

ANNE ARUNDEL: Harwood, VII & VIII-84(WTH).

Manduca jasminearum (Guer.)

BALTIMORE: Parkton, 24-VII-87(FWH). Sparks, 20-VI-68 collected by D.Staines.

Dolba hyloeus (Dru.)

ANNE ARUNDEL: Harwood, 8-VIII-84(WTH).
CALVERT: (2)
*GARRETT: Cranesville Swamp, ex larva eclosed 30-IX-82 collected by E.Cohen. (1)

Ceratomia amyntor (Geyer)

*ALLEGANY: LaVale, 26-VII & 1-VIII-78(JDG).
BALTIMORE: Charlestown-SMSC, 21-VII-78(APP) collected by S.J. Harrison. Sparks, 27-VII-70 collected by C.L.Staines, Jr.

Ceratomia undulosa (Wlk.)

*ALLEGANY: LaVale, 25-VII & 1-VIII-78, 16-VII-81 & 6-VII-82 collected by J.D.Glaser.
BALTIMORE: Baltimore, Ten Hills, 27-VI-83 & 2-VIII-93(RSB), 15-VI-72(APP) collected by D.Powell.

Ceratomia catalpae (Bdv.)

ANNE ARUNDEL: Harwood, VIII-84(WTH).
BALTIMORE: Baltimore, Ten Hills, 18-VII-83(RSB).

*Isoparce cupressi (Bdv.)

CALVERT: (2)

Paratrea plebeja (F.)

ANNE ARUNDEL: Harwood, VII & VIII-84(WTH). Pasadena, 29-VII-84 collected by J.Broersma. (1)
BALTIMORE: Baltimore, Ten Hills, 4 & 20-VIII-56(RSB).
*PRINCE GEORGES: Bowie, 20-VII-78(JDG).

Sphinx eremitus (Hbn.)

*GARRETT: Big Run St. Pk., 12-VIII-85 collected by J.D.Glaser. (1)

Sphinx kalmiae (J.E.Sm.)

ALLEGANY: LaVale, 25-VII & 3-VIII-78(JDG).

*Lapara bombycoides Wlk.

ANNE ARUNDEL: (2)
GARRETT: Carey Run, 10-VII-82(RSB) collected by P.J.Kean.

Lapara coniferarum (J.E.Sm.)

*MONTGOMERY: Chevy Chase, no date given. (3)

Smerinthus jamaicensis (Dru.)

*HARFORD: Aberdeen, 21-VI-72 collected by J.Cavey.

Paonias excaecatus (J.E.Sm.)

*ALLEGANY: Green Ridge St. For., 6-VII-82(RSB) collected by J.D. Glaser. LaVale, 6 & 25-VII & 1-VIII-78(JDG). Rocky Gap St. Pk., 7-VII & 8-VIII-83(RSB) collected by J.D.Glaser.
ANNE ARUNDEL: West River (Shady Oaks Rd.), 12-VIII-84(WTH).
BALTIMORE: Baltimore, Ten Hills, 25-VI-78(RSB).
*GARRETT: Meadow Run Swamp, 12-VI-79(JDG).
PRINCE GEORGES: College Park, 4-VII-72 collected by C.L.Staines,Jr.
*WASHINGTON: Sideling Hill, 8-VII-67(RSB).

Paonias myops (J.E.Sm.)

*ALLEGANY: LaVale, 24-VII & 1-VIII-78(JDG).
ANNE ARUNDEL: Harwood, VIII-84(WTH).
BALTIMORE: Baltimore, Ten Hills, 2 & 28-VII & 14-VIII-83(RSB). Parkton, 20-VII-89(FWH). Sparks, 6-VII-80 collected by C.L. Staines, Jr.
*FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).

Paonias astylus (Dru.)

*ANNE ARUNDEL: Pasadena, 21-VI-84 collected by J.Broersma. (1)

Laothoe juglandis (J.E.Sm.)

*ALLEGANY: Corriganville, 15-VII-81(JDG). LaVale, 11-VI & 25-VII-78 & 4-VIII-83(JDG).
BALTIMORE: Baltimore, Ten Hills, 23-VI & 6-VII-67, 25-VI-78, 14-VI-82, 9-VII-83 & 8-VI-91 & 1-VII-93 & 29-VI-94(RSB).
*FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).

*Pachysphinx modesta (Harr.)

BALTIMORE: Parkton, 24-VII-87(FWH).

MACROGLOSSINAE

Hemaris diffinis (Bdv.)

BALTIMORE: Sparks, 30-VI-68 collected by D.Staines.

Eumorpha pandorus (Hbn.)

ALLEGANY: LaVale, 25-VII-78(JDG).
ANNE ARUNDEL: Harwood, VII & VIII-84(WTH).
BALTIMORE: Baltimore, North Bend, VII-82(RSB) collected by R.Peed. Ten Hills, 11-VII-75(RSB)[collected by Lynn McCoy, the Real Estate agent who was murdered, Dec.1993], 13-VIII-80 & 14-VII-82 (RSB). Parkton, 24-VII-87 & 22-VII-89(FWH). Sparks, 6-VII-80 collected by C.L.Staines, Jr.

Eumorpha achemon (Dru.)

*ANNE ARUNDEL: Glen Burnie, 7-VII-78(APP) collected by W.Beuttner.
BALTIMORE: Sparks, 1-VII-68 collected by D.Staines.

Darapsa myron (Cram.)

*ALLEGANY: Green Ridge St. For., 2-VII-77(RSB). LaVale, 6 & 25-VII & 1-VIII-78, 16-VII-81, 6-VII-82 & 4-VIII-83(JDG).
ANNE ARUNDEL: Harwood, VII & VIII-84(WTH).
BALTIMORE: Baltimore, Ten Hills, 2-VII-83(RSB). Sparks, 13-VII-70 collected by C.L.Staines,Jr.

Darapsa pholus (Cram.)

ALLEGANY: LaVale, 7 & 25-VII-78(JDG).
ANNE ARUNDEL: Harwood, VII & VIII-84(WTH).
BALTIMORE: Baltimore, Ten Hills, 6-VII-83(RSB). Loch Raven, 20-VI-67(RSB).
CALVERT: (2)

Sphecodina abbottii (Swains.)

BALTIMORE: Catonsville-UMBC, 4 & 12-VI-80(RSB) collected by A.P. Platt. Cockeysville, 1-VII-69 collected by D.Staines.

Deidamia inscripta (Harr.)

ALLEGANY: LaVale, 1-VI-78(JDG).
WASHINGTON: Sideling Hill, 1-V-82(RSB) collected by P.J.Kean. South Mountain at I-70, 7-V-80(JDG).

Amphion floridensis B.P.Clark

BALTIMORE: Baltimore, Ten Hills, 11 & 13-VI-91 & 29-VI-94(RSB).
*CALVERT: Plum Point, 4-V-80(RSB) collected by J.H.Fales.
PRINCE GEORGES: College Park, 11-V-70 & 10-VIII-71 collected by C.L. Staines, Jr.

Xylophanes tersa (L.)

ANNE ARUNDEL: Arnold, 4-VI-84 collected by J.Broersma. (1)
BALTIMORE: Parkton, 24-VII-87(FWH).

Hyles lineata (F.)

ANNE ARUNDEL: Harwood, VI & VII-84(WTH).
BALTIMORE: Parkton, 24-VII-87(FWH).
CALVERT: (2)
*HARFORD: Aberdeen, 26-VII-76 collected by M.Wilson.
*QUEEN ANNES: Kent Island, 3-IX-87(RSB) collected by P.J.Kean.

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A LEPIDOPTERIST'S EXPEDITION TO RONDONIA, BRAZIL

Joy Cohen and Edgar Cohen, Jr.

In thinking about our spring vacation for 1991, we wavered between two possibilities - make a fifth group entomological expedition to South America with Holbrook Travel as planner and Dr. Tom Emmel, Professor of Biology at the University of Florida, as leader or treat ourselves to a vacation some place in western Europe with all the comforts. We decided to go to Rondonia for the period of March 13-24.

The first physical problems we had to endure were those that normally accompany jet lag, and missing much of a night's sleep. In all, not even counting the time it took us to reach Miami Airport, where we met the group, the total trip took twenty-five hours. Other disadvantages included stomach discomforts due to foreign bacteria in food and water, the necessity of often spraying ourselves with repellent, no electricity after 11:00 p.m., no bathrooms in our cabins, the heat and humidity, the frequency and intensity of rain, and the unavailability of medical care.

There are many developed areas in the state of Rondonia, in western Brazil but, for those areas that remain as they were, the term "rain forest" is used collectively. It is generally thought by many scientists that the Rondonian area is the most incredibly diverse area in the world for butterflies. It is also very rich in other insect and plant life. Sadly, because of the accelerated human development of this general area, there might be virtually nothing left of the original rain forest habitat for these forms of life within the next decade. However, Dr. Emmel and other ecological activists are purchasing land in an attempt to obviate this possibility.

We stayed at the Fazenda Rancho Grande which is owned by the Harald Schmitz family who were excellent hosts to us. They provided all our home-cooked meals, cleaned for us and chauffeured us when necessary. We met many interesting people, and it always seems on these trips that, by staying in such close quarters with people for about a week, you get to know them.

Our collecting efforts were well rewarded with the capture of three species of morpho - namely, Morpho menelaus (L.), M. achilles (L.), and M. helenor (Cr.). Several other species of morpho are also found in this territory. Morpho rhetenor (Cr.), M. cisseis (Feld.), and M. telemachus (L.) are relatively uncommon, the last of which is usually seen flying high in the forest canopy, seldom descending to within reach of the collector.

A partial list of Rondonian butterfly species is given in an article entitled The Tropical Rain Forest Butterfly Fauna of Rondonia, Brazil: Species Diversity and Conservation by Thomas C. Emmel and George T. Austin, published in Tropical Lepidoptera, Vol. 1, No. 1, 1990. A list of butterflies collected on our March trip has not yet been completed, but those obtained on our previous December 1990 trip to this area have been ascertained and are listed here by family and at least to genus.

Hesperiidae:

Entheus priassus (L.)
Heliopetes petrus (Hbn.)
Urbanus doryssus (Swains.)

Riodinidae:

Mesosemia sifia (Bsdv.)
Mesosemia minos (Hew.)
Charis sp.
Calospila emylius (Cr.)
Amarynthis meneria (Cr.)
Thysanota galena (Bates)
Lasaia agesilas (Latr.)
Parcella amarynthina (Feld.)

Lycaenidae:

Thecla sp.
Calycopis isobeon (Btlr.& Druce)

Nymphalidae:
Brassolinae:

Caligo eurilochus (Cr.)

Heliconiinae:

Heliconius numata (Cr.)
Heliconius wallacei (Reak.)
Heliconius erato (L.)
Heliconius sara (Fab.)
Eueides aliphera (Godt.)
Dryadula phaetusa (L.)

Ithomiinae:

Melinaea menophilus (Hew.)
Scada theaphia (Bates)
Scada reckia (Hbn.)
Mechanitis polymnia polymnia (L.)
Mechanitis lysimnia (Fab.)
Hypoleria proxima (Weym.)
Hypothyris semifulva (Salv.)
Hypothyris mamercus (Hew.)
Hypothyris fluonia (Hew.)
Methona grandior (Forbes)
Aeria eurimedia (Cr.)
Ithomia agnosia (Hew.)

Morphinae:

Morpho achilles (L.)
Morpho helenor (Cr.)

Nymphalinae:

Marpesia hermione (Feld.)
Marpesia chiron (Fab.)
Marpesia crethon (Fab.)
Marpesia orsilochus (Fab.)
Memphis morvus (Coms.)
Memphis glauce (Feld.)
Pyrrhogyra otolais (Bates)
Doxocopa laure (Dry.)
Nessaea obrinus (L.)
Colobura dirce (L.)
Castilia angusta (Hew.)
Adelpha mesentina (Cr.)
Diaethria clymena (Cr.)
Phyciodes liriope (Cr.)
Eunica orphise (Cr.)
Eresia eunic· (Hbn.)
Zaretis itys (Cr.)
Dynamine racidula (Hew.)
Euptoieta hegesia (Cr.)

Satyrinae:

Haetera piera (L.)
Taygetis virgilia (Cr.)
Euptychia hermes (Fab.)
Euptychia cephus (Fab.)
Precis evarete (Cr.)
Pierella lena (L.)
Pierella hyceta (Hew.)

Papilionidae:

Parides neophilus consus (R.& J.)
Parides vertumnus vertumnus (Cr.)
Papilio torquatus (Cr.)
Battus lycidas (Cr.)

Pieridae:

Anteos menippe (Hbn.)
Eurema albula (Cr.)
Phoebis philea (L.)
Ascia monuste (L.)
Ascia buniae (Hbn.)

In addition to butterflies collected in December, there were a number of interesting moths that were obtained, one of which, a female Thysania agrippina (Cr.), in the family Noctuidae, had a seven inch wingspan! This particular moth species has the largest wing expanse of any tropical butterfly or moth. Also, we found an abundance of brightly colored day-flying geometrid moths and a number of sphingids coming to the lights. Of the spectacular day-flying moths, one sees a number of Urania leilus (L.) alighting on the dirt roads adjoining the fazenda

where our group was staying and a fair number of castniid moths. Even though the March list of species is not yet completed some notable additions to our collection are Napeocles jucunda (Hbn.)(Nymphalidae), Selenophanes cassiope (Cr.)(Nymphalidae, Brassolinae), and Morpho menelaus (L.)(Nymphalidae, Morphinae). Beetle and bug enthusiasts will find many interesting species as well. One member of our March group brought back a number of interesting buprestid beetles. On one side trip a sizeable population of Acrocinus longimanus (L.), the harlequin beetle, was discovered.

We feel our decision to sacrifice some physical comfort for the sake of enjoying the collecting, the beauty, the natural diversity and the people of Rondonia, as well as the companionship of our group, was the right choice. Furthermore, the butterflies and other insects in our displays, as well as our photographs, speak to the beauty of the rain forest more clearly than mere words can tell.

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ADDITIONS TO THE LIST OF MARYLAND LITHOSIINAE, ARCTIINAE, CTENUCHINAE, NOLINAE AND AGARISTINAE

Robert S. Bryant

During the twelve years since the first Maryland arctiid list appeared (Bryant, 1982), six new species have been added and nearly ten times as many new county records have been reported, most of them during the period immediately following the publication of that list. Hopefully, by publishing the new data, at this time, it will stimulate renewed interest among Maryland's heterocerists. The new records are marked with an asterisk for easy identification when comparing with the first list. I have also added some supplemental records (from papered and frozen material and other sources) to some of the species that were previously reported in order to extend flight period data, as with the extremely early record for Nola sorghiella Riley or to augment other insufficient information, such as the new Baltimore County record for Comachara cadburyi Franc. taken many years ago in my back yard.

Haploa confusa form "triangularis" Smith, which was mentioned as only a possibility for Maryland, in the last list, is now added to our fauna with the capture of a specimen in Allegany County (J.D. Glaser, pers. comm.)

The small, unnamed Apantesis sp. that was mentioned in the last list was eventually described by Dr. Douglas Ferguson and received the name carlotta. We now have it recorded from six counties.

More recently, in fact while this paper was in preparation, J.P. Donahue made good on his promise of 25 years ago and published new distribution records for the genus Phragmatobia in North America. He cited two of my specimens from the Stevenson area of Baltimore County but apparently did not conduct a thorough enough literature search to discover my 1982 paper. It is also unfortunate that one of his reviewers did not mention the important work that has been done in Maryland, by so many avid collectors, in regard to the Arctiidae. P. lineata Newman & Donahue is more widely distributed through central Maryland than those first two records would seem to indicate. While it is gratifying to be credited with a state record by an author of Mr. Donahue's stature,

officially, the species was reviewed and recorded for Maryland more than ten years ago in the pages of this journal.

A second species of Phragmatobia has also turned up in Maryland. John Glaser collected a specimen of P. fuliginosa rubricosa (Harr.) at Rocky Gap State Park, in Allegany County, in 1983. This locality is about 30 miles south and east of Somerset, Pa., the southern most record in the east, until now.

There is a third member of this genus which also, ironically, has not been taken south of Somerset Co., Pa. but is a probable Maryland resident, nevertheless. Six specimens of P. assimilans Wlk. were recently (1986) collected in hemlock forest near the summit of Mt. Davis, the highest point in Pa. It now seems certain that assimilans will turn up along the higher ridges of Negro Mountain, in Maryland, just west of Grantsville. The optimum time to look for it would be the first half of May because, unlike the other two species, assimilans is an early flyer.

In the list below, the counties are arranged alphabetically and in a column to facilitate fast reference. The initials following the dates, in most cases, indicate the collector and/or the present location of the specimen. For explanation of the initials consult the acknowledgements section. Entries followed by the number one, in parentheses, were reported in a past issue of Phaeton. Entries followed by the number two, in parentheses, were reported in the last issue of this journal. The listing follows the arrangement in the McDunnough check list except for the nolids which have been placed toward the end, this time, as they are no longer considered to be part of the Arctiidae. The nomenclature has been updated to reflect that used by Hodges, Covell and other contemporary authors.

As in the past, I would appreciate being apprised of any new species or new county records that might turn up so that this list may be updated on a more regular basis.

ARCTIIDAE
CTENUCHINAE

Cisseps fulvicollis (Hbn.)

*ALLEGANY: Rocky Gap St. Pk., 10 & 22-VII-82(RSB) collected by J.D. Glaser.
*ANNE ARUNDEL: (2)

Ctenucha virginica (Esper)

ALLEGANY: Rocky Gap St. Pk., 22-VII-82(RSB) collected by J.D.Glaser.

LITHOSIINAE

Crambidia pallida Pack.

*ANNE ARUNDEL: (2)

*Crambidia lithosioides Dyar

ANNE ARUNDEL: (2)

Crambidia uniformis Dyar

*ANNE ARUNDEL: (2)

*Cisthene tenuifascia Harv.

ANNE ARUNDEL: (2)

Cisthene packardii (Grt.)

*ANNE ARUNDEL: (2)
*WICOMICO: Mardela Springs, 17-VIII-84(RSB) collected by J.D.Glaser.

Cisthene plumbea Stretch

*ANNE ARUNDEL: (2)
*CHARLES: LaPlata, 9-IX-83(JDG).
*WORCESTER: Pocomoke St. For., 15-IX-83(JDG).

Clemensia albata Pack.

*ANNE ARUNDEL: (2)
*CALVERT: (2)

Hypoprepia miniata (Kby.)

*ANNE ARUNDEL: (2)
*CALVERT: (2)

Hypoprepia fucosa Hbn.

ALLEGANY: Rocky Gap St. Pk., 21-VII-82(RSB) collected by J.D.Glaser.
*ANNE ARUNDEL: (2)

Comachara cadburyi Franc.

*ANNE ARUNDEL: (2)
*BALTIMORE: Baltimore, Ten Hills, 14-V-68(RSB).

ARCTIINAE

Lophocampa caryae Harr.

*ALLEGANY: Rocky Gap St. Pk., 25-V & 10-VI-83(RSB) collected by J.D. Glaser.

Halysidota tessellaris (J.E.Sm.)

*CALVERT: (2)
*CARROLL: Marriottsville, 24-VI-69(RSB).
*FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).
*WASHINGTON: Sideling Hill, 8-VII-67(RSB).

Cycnia tenera Hbn.

*CALVERT: (2)
*WASHINGTON: Sideling Hill, 22-VI-82(RSB) collected by J.D.Glaser.

Cycnia oregonensis (Stretch)

*ANNE ARUNDEL: (2)
*CALVERT: (2)

Euchaetes egle (Dru.)

*ANNE ARUNDEL: (2)
*CALVERT: (2)

Holomelina aurantiaca (Hbn.)

*ANNE ARUNDEL: (2)
*CALVERT: (2)
*WICOMICO: Mardela Springs, 17-VIII-84(RSB) collected by J.D.Glaser.

Holomelina opella (Grt.)

*ANNE ARUNDEL: (2)
*CALVERT: (2)

Holomelina ferruginosa (Wlk.)

*ANNE ARUNDEL: (2)
*CALVERT: (2)

*Phragmatobia fuliginosa rubricosa (Harr.)

ALLEGANY: Rocky Gap St. Pk., 17-VIII-83(JDG)

Apantesis virgo (L.)

ALLEGANY: LaVale, 4-VIII-83(RSB) collected by J.D.Glaser.
ANNE ARUNDEL: Harwood, VII & VIII-84(WTH).
WICOMICO: Salisbury, 18-VIII-82(RSB) collected by J.D.Glaser.

*Apantesis parthenice (Kby.)

CALVERT: (2)

Apantesis arge (Dru.)

ANNE ARUNDEL: Harwood, VII & VIII-84(WTH).
*CALVERT: Bowens, 2-IV-83(JDG).

Apantesis anna (Grt.)

ALLEGANY: Rocky Gap St. Pk., 21-VI-83(JDG).

*CALVERT: Calvert Cliffs St. Pk., 24-VI-83(JDG).

form "persephone" (Grt.)

*ALLEGANY: Rocky Gap St. Pk., 21-VI-83(JDG).
*ANNE ARUNDEL: (2)
*FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).

Apantesis figurata (Dru.)

*ALLEGANY: Rocky Gap St. Pk., 10-VI-83(JDG).
*ANNE ARUNDEL: (2)
*CALVERT: (2)

Apantesis phyllira (Dru.)

*ALLEGANY: Rocky Gap St. Pk., 15-VI-83(JDG).

Apantesis carlotta Fgn.

*CALVERT: (2)

Apantesis nais (Dru.)

ALLEGANY: Rocky Gap St. Pk., 26-V & 10-VI-83(RSB) collected by J.D. Glaser.
BALTIMORE: Baltimore, Ten Hills, 16-VIII-66(RSB).
*CALVERT: (2)

Apantesis phalerata (Harr.)

*ALLEGANY: Rocky Gap St. Pk., 10-VI-83(RSB) collected by J.D.Glaser.
*CALVERT: (2)

Spilosoma latipennis Stretch

*ANNE ARUNDEL: (2)
*CALVERT: (2)
*FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).

Spilosoma virginica (F.)

*CALVERT: (2)

Spilosoma congrua Wlk.

BALTIMORE: Baltimore, Ten Hills, 9 & 22-VI-83(RSB).
*CALVERT: (2)

Pyrrharctia isabella (J.E.Sm.)

BALTIMORE: Baltimore, Ten Hills, 25-VIII-83(RSB).
*CARROLL: Marriottsville, 24-VI-69(RSB).
*FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).

Hyphantria cunea (Dru.)

BALTIMORE: Baltimore, Ten Hills, 10-V-83(RSB).
*CALVERT: (2)
*FREDERICK: Catoctin Mtn. Pk., 24-VI-83(RSB).

Ecpantheria scribonia (Stoll)

*ALLEGANY: Rocky Gap St. Pk., 22-VI-82(RSB) collected by J.D.Glaser.
CARROLL: Camp Hashawa, 7-VI-81(RSB) collected by P.J.Kean.
PRINCE GEORGES: Bowie, 27-V-82(RSB) collected by J.D.Glaser.

Utetheisa bella (L.)

ANNE ARUNDEL: Harwood, 13-VIII-84(WTH).

Haploa clymene (Brown)

BALTIMORE: Baltimore, Ten Hills, 12-VII-83(RSB).

*Haploa reversa (Stretch)

ALLEGANY: Green Ridge St. For., 17-VII-82(RSB) collected by W.A. Andersen.

Haploa lecontei (Guer.)

ALLEGANY: Green Ridge St. For., 2-VII-83(RSB) collected by W.A. Andersen.

form "militaris" (Harr.)

ALLEGANY: Green Ridge St. For., 17-VII-82(RSB) collected by W.A. Andersen.

*Haploa confusa (Lyman)

form "triangularis" Sm.

ALLEGANY: Rocky Gap St. Pk., 17-VIII-83(JDG).

NOCTUIDAE
NOLINAE

Nola sorghiella Riley

BALTIMORE: Baltimore, Ten Hills, 29-VI & 28-VIII-83(RSB).

Meganola minuscula (Zell.)

*ANNE ARUNDEL: (2)
*CALVERT: (2)

AGARISTINAE

Alypia octomaculata (F.)

*KENT: Horsehead Sanctuary, 9-V-87 collected by H.Godwin. (1)

*Psychomorpha epimenis (Dru.)

ALLEGANY: Green Ridge St. For., 26-IV-81(RSB).
BALTIMORE: Catonsville-Rolling Road G.C., 23-IV-67(RSB) collected by S.H.Bryant.
CARROLL: Reese, 17-IV-68(RSB).
WASHINGTON: Sandy Hook, 14-IV-77 & 16-IV-81(RSB) collected by W.A. Andersen. Seavolt Rd., 20-IV-77 & 26-IV-81(RSB).

*Eudryas unio (Hbn.)

ANNE ARUNDEL: (2)
BALTIMORE: Catonsville-UMBC, 31-V-76(RSB). Parkton, 27-VII-89(FWH).
CALVERT: (2)
CARROLL: Camp Hashawa, 7-VI-81(RSB) collected by P.J.Kean.
CECIL: Conowingo, 9-VI-73(RSB).
HOWARD: Woodbine, VII-61(RSB) collected by S.Dobbs.
MONTGOMERY: Seneca, 9-VIII-79(RSB) collected by W.A.Andersen.

*Eudryas grata (F.)

ANNE ARUNDEL: (2)
BALTIMORE: Baltimore, Ten Hills, 12-VIII-64, 28-VI-65, 28-VI & 3-VII & 24-VIII-69, 24-VI-73, 25-VI-79 & 12-VII-83(RSB). Loch Raven, 28-VI-71(RSB).
CALVERT: (2)
ST. MARYS: Lexington Park, 26-VI-76(RSB).

Acknowledgements

I want to thank Mr. John D. Glaser and Mr. Philip J. Kean, both of Baltimore, Md., and Dr. William A. Andersen of Lutherville, Md. for supplying data from their own collections and especially for donating unneeded papered specimens to the Maryland Moth Survey collection. I am also deeply indebted to Mr. Frederick W. Holland of Baltimore, Md. and Mr. William T. Hopkins, Jr. of Shadyside, Md. for reviewing their collections and supplying the requested information.

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ALTERNATIVE WAYS TO COLLECT INSECTS

4. Insects on Tobacco Premiums

Robert S. Bryant

There have been three main types of tobacco premiums featuring insects; cards, silks and flannels.

Prior to 1880 the paper wrapped cigarette was not as important to the tobacco industry as those wrapped in a tobacco leaf (called little cigars today) but a few farsighted manufacturers believed there might be a future in the paper smokes. Allen & Ginter of Richmond, in the heart of tobacco country, was one of the leading makers at the time. Major Ginter, a former Confederate officer, employed girls from good southern families to hand roll the cigarettes and package them in neat, round bundles of 20. Around 1885 the small shell and slide box was invented which held ten cigarettes and sold for .05¢. To help promote the product, a small picture card was packed in each box. Sales immediately took off and in the 1885-1892 period almost every manufacturer used cards, at least for a time. Cigarettes became big business and when the girls could no longer meet the demand, fast automatic machines took their place. Cards were produced covering every imaginable subject, literally from A to Z (actresses to zoo animals and everything in between), and many of the tobacco companies issued sets of butterflies. Generally speaking, these took three forms - representations of natural specimens, artist's conceptions of what butterflies should look like and mythical creatures in the form of scantily clad ladies with butterfly wings. Gradually, Duke began to dominate the cigarette market and as competition was eliminated, premium inducements were no longer needed and the first cigarette card era ended by 1895.

The second cigarette card era was ushered in when several small Greek manufacturers started using aromatic Turkish tobacco in their cigarettes and revived the practice of putting insert cards in the packages to stimulate interest. Soon most of the large tobacco companies were introducing Turkish tobacco brands and using the cards again. The period only lasted from 1910-1915 but accounted for another large outpouring of cards on a great variety of subjects, including butterflies. Also during the 1912-1915 period swatches of printed cloth were distributed as premiums with certain brands in an obvious attempt to appeal to women. These rectangles of silk and flannel were intended to be sewn together to form pillow tops, table cloths and bed spreads. However, the flannel pieces were not color fast and were quickly ruined the first time they were washed or even if any liquid spilled on them.

Several English tobacco companies have also produced sets of cards on various topics and silks featuring sets of butterflies and/or moths.

Just before the turn of the century a period of fierce competition developed between The American Tobacco Company (ATC) and British interests headed by The Imperial Tobacco Company. This "Tobacco War" lasted from approximately 1892-1902 with each faction trying to establish dominance in the British and Far East markets. One of the main weapons was the cigarette card and several dozen sets were produced by the ATC, one of which featured girls with butterfly wings. In 1902 the war ended with the formation of The British-American Tobacco Company (BAT), an export firm, which took over export transactions for the two adversaries. BAT issues, henceforth, were purely British and at least one set of butterfly cards was issued under their auspices.

Unlike their American counterparts, British tobacco companies have continued to use insert cards as premiums. The Doncella "British Butterflies" set of 32 large cards, issued by John Player & Sons, in 1984, is one of the most recent offerings. Although most insect sets are either all butterflies or butterflies with a few large colorful moths added, I have located one set of 50 cards from New Zealand entitled "N.Z. Butterflies, Moths & Beetles" with a somewhat broader appeal. This 1925 set, issued by W.D. & H.O. Wills of Bristol and London, was a bit pricey so I only ordered two cards of each of the insects named in the title. When they arrived there was no problem with the butterflies or moths but one of the beetles was the large green Stone-fly, Stenoperla prasina and clearly marked as such. Apparently the set was more inclusive than the title would suggest.

Prices of cards vary considerably depending on age, condition and availability. Some of the newer sets can be acquired in toto for less than .50¢ per card, whereas the older cards may cost $40 each, or more, with very little possibility of ever obtaining a full set. Silks generally sell for $5-$6 each but can occasionally be obtained for under $3 if one is willing to accept less than perfect examples. English silks run around $10-$20 each but can frequently be acquired for less. When it comes to dealers, caveat emptor seems appropriate. While the majority are accommodating and as reasonable as possible, there are a few hustlers. Probably the best advice would be to join a card collector's club such as The Cartophilic Society of Great Britain, Ltd., or subscribe to a magazine such as the Card Collectors Bulletin or the Cigarette Card News.

Fig. 1 - Morpho cypris,* ACC set #183, No.48 in a set of 50 entitled "Butterflies", distributed by Wm. S. Kimball & Co. with OLD GOLD, VANITY FAIR, SWEET LAVENDER, THREE KINGS, SALAMAGUNDI, PEERLESS STRAIGHT CUT, MONTE CRISTO & other brands of cigarettes.

Fig. 2 - Feronia, Goddess of Plants & Freedmen, ACC #256, No.7 of 25, entitled "Ancient Mythology Burlesqued", distributed by Lorillard with TIGER & .5¢ ANTE tobacco.

Fig. 3 - "Butterflies of the World", ACC #217, set of 50 cards, could be placed on a large banner (sold separately) to form a picture. Distributed by Kinney Bros. with SWEET CAPORAL, SPORTING EXTRA, FULL DRESS, CLEOPATRA, EGYPTIAN FLOWERS & other brands.

*ACC # = Numbers assigned to card sets listed in the American Card Catalog.

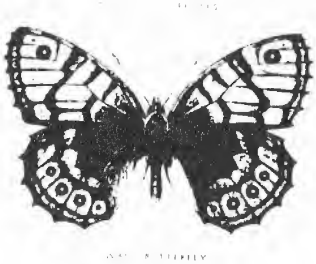
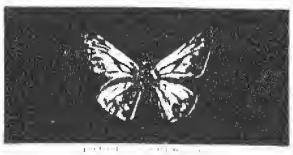


Fig. 4 - Archonias sp., ACC #T48, set of 50 cards entitled "Butterfly Series", distributed with TURKEY RED cigarettes.
Fig. 5 - Wall Butterfly (Pararge megera). English set entitled "Butterflies & Moths", No.14 of 40, distributed by W.D & H.O.Wills with GOLD FLAKE, CAPSTAN, THREE CASTLES & EMBASSY cigarettes,1938.



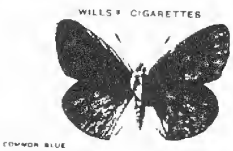
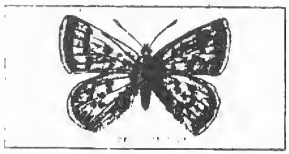
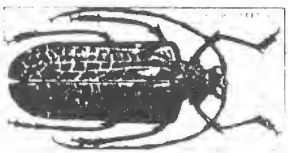
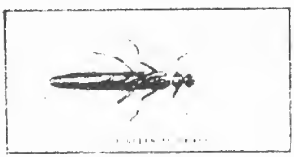


Fig. 6 - Large Skipper (Ochlodes venatus Brem.). English set entitled "British Butterflies", No.10 of 25, distributed by Godfrey Phillips, Ltd., London, 1927.
Fig. 7 - Common Blue (Lycaena icarus Rott.). English set entitled "British Butterflies", No.6 of 50, distributed by The Imperial Tobacco Co., W. Will's cigarettes. 1927.

Fig. 8 - Marbled White (Melanargia galatea Linn.). English set entitled "British Butterflies", No.46 of 50, distributed by British American Tobacco Co. (BAT). 1930.
Fig. 9 - Precis octavia Cr., showing wet and dry seasonal forms. English set entitled "Butterflies", No.22 of 50, distributed by John Player and Sons. 1932.

Fig. 10 - Privet Hawk (Sphinx ligustri). English set entitled "Butterflies and Moths", No.26 of 48, distributed by Gallaher Ltd. 1938.
Fig. 11 - Brimstone (Gonepteryx rhamni). English set entitled "British Butterflies", No.22 of 25, distributed by Abdulla & Co.Ltd.1935.

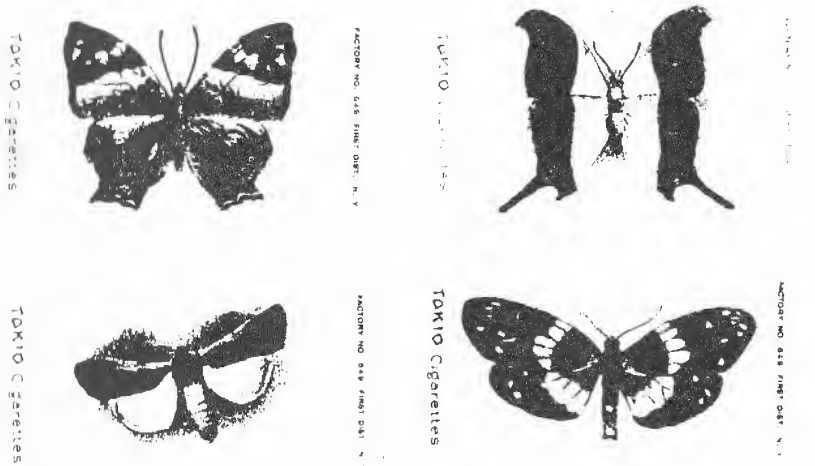


Figs. 12-17 - New Zealand set entitled "N.Z. Butterflies, Moths & Beetles" distributed by W.D. & H.O. Wills. 1925.
Fig. 12 - Copper Butterfly (Chrysophanus sallustius) No.2 of 50.
Fig. 13 - Pluto Butterfly (Erebia merula) No.46 of 50.
Fig. 14 - Pale Declana Moth (Declana junctilinea) No.24 of 50.
Fig. 15 - Giant Swift Moth (Charagia virescens) No.3 of 50.
Fig. 16 - Hu-hu Beetle (Prionoplus reticularis) No.5 of 50.
Fig. 17 - Large Green Stone-fly (Stenoperla prasina) No.31 of 50.

Fig. 18 - Duke of Burgundy Fritillary (Hamearis lucina Linn.). English set entitled "British Butterflies", No.16 of 32, distributed by John Player and Sons. 1984.

Figs. 19-20 - Flannel blankets (no fringe), ACC #Bi4. Set of 50 mixed butterfly & moth designs (large, 5½ X 8½"). 1912-1915.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FACTORY NO. 649 FIRST DIST. N. Y.
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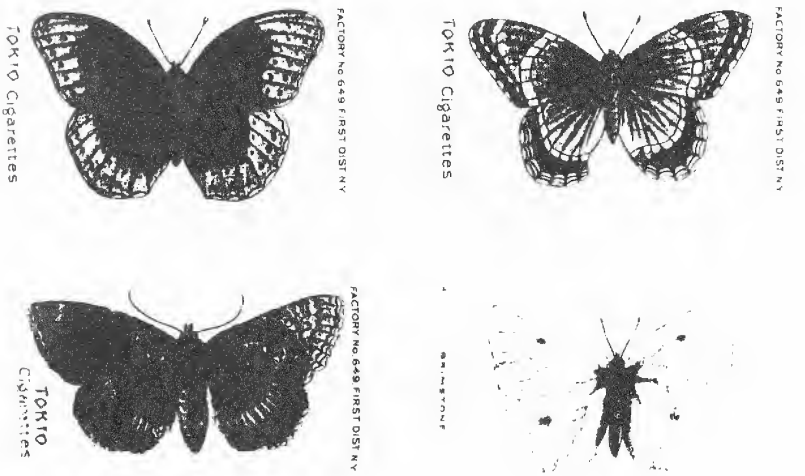
Figs. 21-24 - Silks (printed design), ACC #S9-2. Set of 50 butterflies and moths (small, 2 X 3¼"), distributed with TOKIO, CLIX, PIEDMONT & OLD MILL cigarettes. The figures are Hypanartia lethe Fabr. #39, Timetes coresia Godt. #43, Agrotis ypsilon Rott. #30 and Eusemia sp. #35. 1912-1915.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Figs. 25-27 - Silks (printed design), ACC #S9-3A. Set of 25 butterflies and moths (small, 2 X 3¼"), distributed with TOKIO, CLIX, PIEDMONT & OLD MILL cigarettes. The figures are Diana Fritillary (Speyeria diana Cram.) #4, Bastard Purple (Basilarchia hybrid?) #16 & Clifden Nonpareil (Catocala fraxini Linn.) #20.

Fig. 28 - Silk (printed design), ACC #S9-3B. A variation of #S9-3A but distributed in England, probably by BAT. No.4 of 25, Brimstone (Gonepteryx rhamni Linn.). 1912-1915.

Fig. 29 - Silk (printed design), ACC #S8. Set of 6 butterflies & moths (large, 4½ X 6 3/4"), distributed with TOKIO cigarettes. The figure appears to be Papilio zelicaon Lucas #5. 1912-1915.

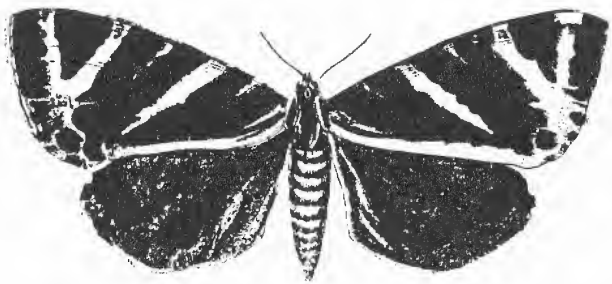

Fig. 30 - Jersey Tiger (Euplagia quadripunctaria Poda). English silk with paper backing. Six in set, all moths. Distributed by R.J. Lea, Ltd., Manchester, with GOLDEN KNIGHT cigarettes.

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Tables: Tables, graphs and line drawings should be done with indelible, black ink and should be placed on separate sheets, following the main text, with the approximate desired position indicated in the text.

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COVER ILLUSTRATION

Printed silk tobacco premium, The Baltimore (Euphydryas phaeton Drury) No. 14 in a set of 25, distributed by the American Tobacco Co., 1912-1915.